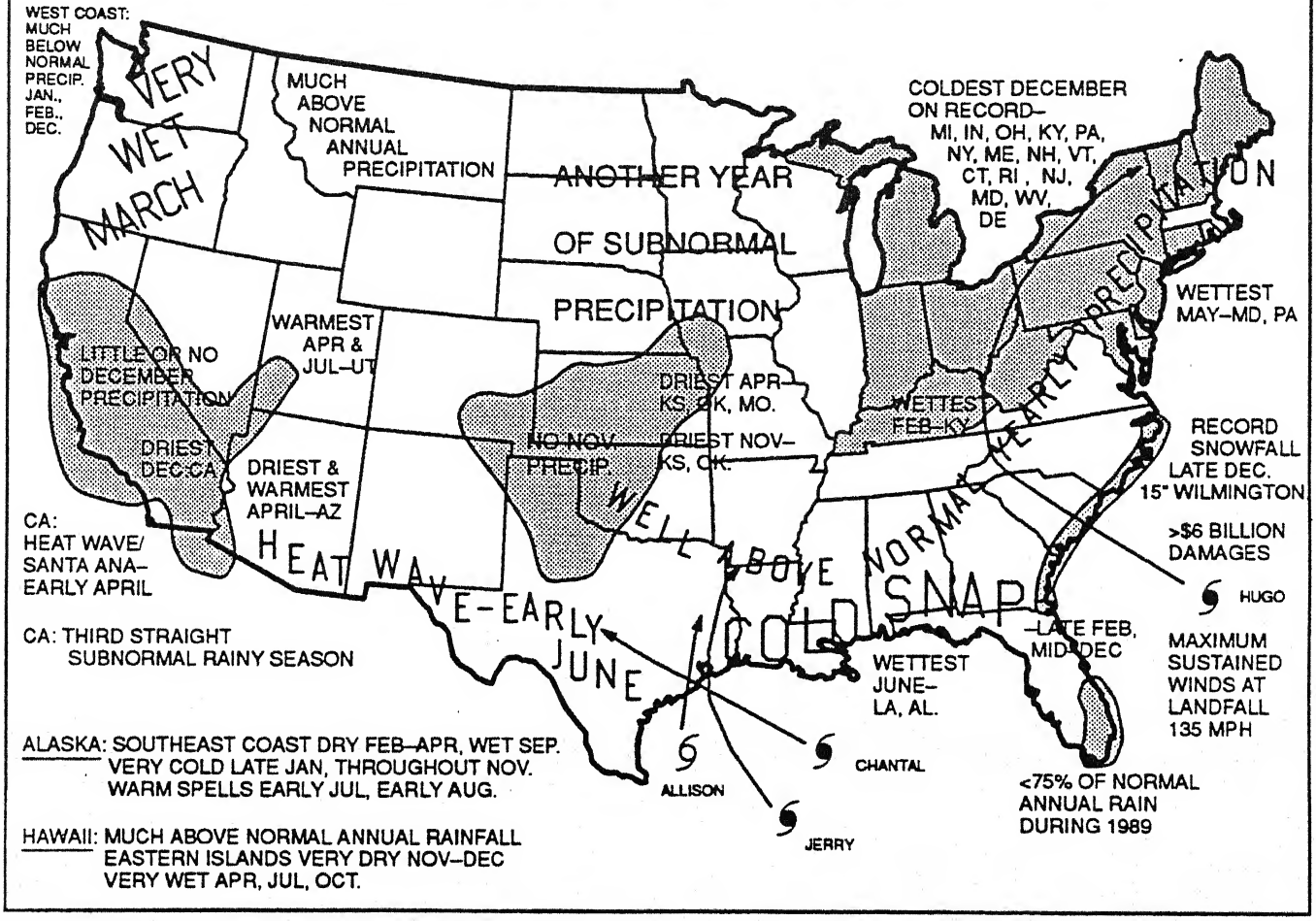
CLIMATE ANALYSIS CENTER

*CONTAINS*:
THE 1989
UNITED
STATES
CLIMATE
SUMMARY

# WEEKLY CLIMATE BULLETIN

**No. 90/02** **Washington, DC** **January 13, 1990**

## MAJOR CLIMATIC AND EPISODIC EVENTS DURING 1989




*FOR ADDITIONAL INFORMATION ON THE MAJOR CLIMATIC AND EPISODIC EVENTS IN THE UNITED STATES DURING 1989, REFER TO THE ANNUAL U. S. CLIMATE REVIEW COMMENCING ON PAGE 9.*

**UNITED STATES DEPARTMENT OF COMMERCE**

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

NATIONAL WEATHER SERVICE – NATIONAL METEOROLOGICAL CENTER

**CLIMATE ANALYSIS CENTER**

# WEEKLY CLIMATE BULLETIN

This Bulletin is issued weekly by the Climate Analysis Center and is designed to indicate, in a brief concise format, current surface climatic conditions in the United States and around the world. The Bulletin contains:

- Highlights of major climatic events and anomalies.
- U.S. climatic conditions for the previous week.
- U.S. apparent temperatures (summer) or wind chill (winter).
- U.S. cooling degree days (summer) or heating degree days (winter).
- Global two-week temperature anomalies.
- Global four-week precipitation anomalies.
- Global monthly temperature and precipitation anomalies.
- Global three-month precipitation anomalies (once a month).
- Global twelve-month precipitation anomalies (every three months).
- Global three-month temperature anomalies for winter and summer seasons.
- Special climate summaries, explanations, etc. (as appropriate).

*Most analyses contained in this Bulletin are based on preliminary, unchecked data received at the Climate Analysis Center via the Global Telecommunications System. Similar analyses based on final, checked data are likely to differ to some extent from those presented here.*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# GLOBAL CLIMATE HIGHLIGHTS

## MAJOR EVENTS AND ANOMALIES AS OF JANUARY 13, 1990

1. *Southern Canada and North–Central United States*:

### UNSEASONABLE WARMTH DEVELOPS.

Spring–like weather developed across the region as temperatures generally averaged between 6°C and 13°C above normal. Some stations observed daily maximums as high as 24°C around midweek before slightly cooler air moved into the region [2 weeks].

2. *Western United States and Southwestern Canada*:

### MORE PRECIPITATION EASES DRYNESS.

Very heavy rains (up to 350 mm) fell along coastal portions of Washington and Oregon, generating severe local river flooding, while light to moderate totals (7 mm to 100 mm) were reported throughout the remainder of the region. Recent precipitation, however, has only slightly eased long–term moisture deficits caused by December's record dryness [Ending at 7 weeks].

3. *Brazil*:

### RECENT HEAVY RAINS ABATE SOMEWHAT.

Up to 200 mm drenched portions of south–central Brazil, but most locations farther north and west observed only 40 to 80 mm as rainfall totals diminished across most of the affected areas [7 weeks].

4. *Northern Argentina*:

### PERIODS OF HEAT CONTINUE.

Sporadic periods of anomalously hot weather continued to plague central South America. Last week, the greatest positive departures (between +2°C and +5°C) were found across extreme northern portions of Argentina. Farther south, near to below normal temperatures brought an end to significant warmth in central Argentina [3 weeks].

5. *Southern Europe*:

### VERY DRY WEATHER CONTINUES.

Although 30 to 60 mm of precipitation fell across central Italy, the vast majority of southern Europe received less than 10 mm last week as moisture deficits continued to increase across the region. During the past four weeks, the entire area received less than half the normal precipitation. In addition, eastern portions of the region reported unusually chilly conditions as temperatures averaged from 2°C to 8°C below normal [7 weeks].

6. *Zimbabwe, Mozambique, Madagascar, and Indian Ocean Islands*:

### TORRENTIAL RAINS SOAK REGION.

After Tropical Cyclone Alibera dropped up to 200 mm of rain on eastern Madagascar two weeks ago, heavy rainfall continued across northern portions of the island, as well as over nearby Indian Ocean islands and central portions of Mozambique and Zimbabwe. Last week, nearly 350 mm inundated coastal Mozambique while 80 to 150 mm were observed across the remainder of the area [2 weeks].

7. *Southeastern South Africa*:

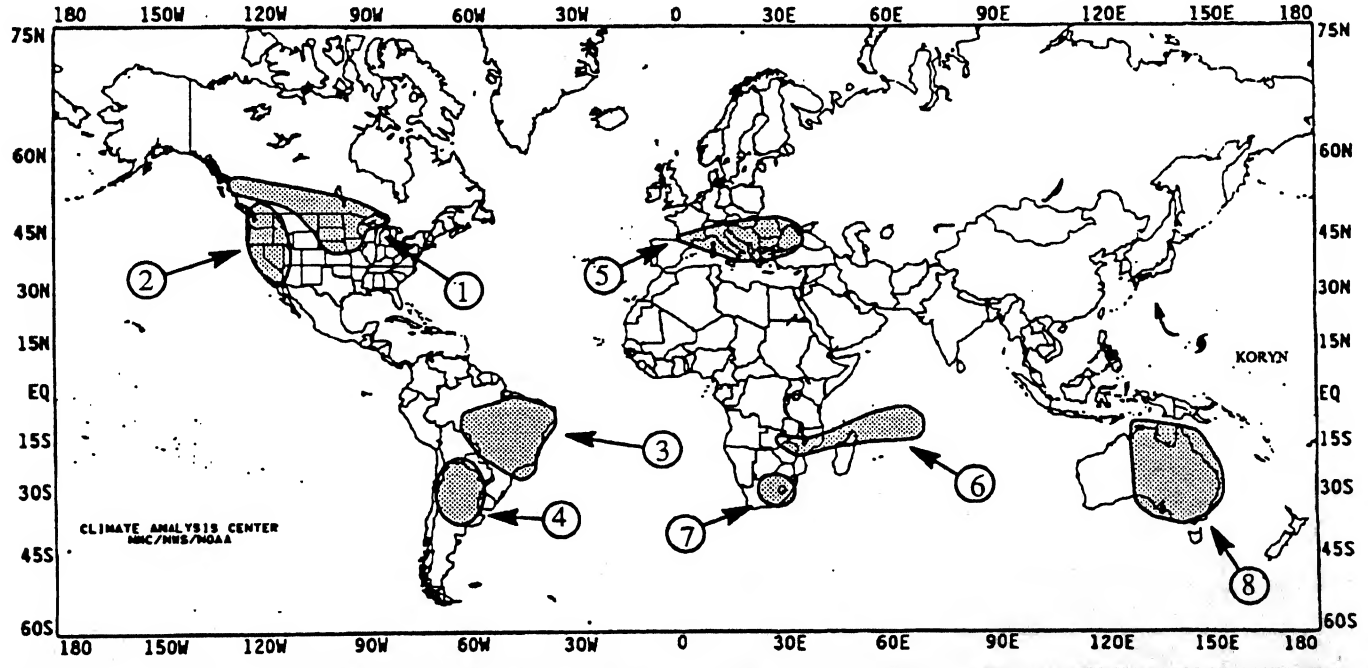
### HEAVY PRECIPITATION ABRUPTLY ENDS DRYNESS.

Rainfall dramatically increased across the formerly dry portion of South Africa as 40 to 90 mm of rainfall dampened the area [Ended at 4 weeks].

8. *Eastern Australia*:

### HEAT AND DROUGHT EASE SLIGHTLY.

More than 100 mm of rain drenched coastal sections of Arnhem Land, but the 10 to 50 mm of rainfall reported across the remainder of the eastern half of the continent only slightly eased dryness as most stations have received less than half the normal precipitation during the past four weeks. In addition, temperatures generally running 2°C to 5°C above normal across interior portions of eastern Australia have combined with the anomalous lack of rainfall to produce damaging wildfires in western sections of Queensland and New South Wales, according to press reports [4 weeks].




**EXPLANATION**

TEXT: Approximate duration of anomalies is in brackets. Precipitation amounts and temperature departures are this week's values.

MAP: Approximate locations of major anomalies and episodic events are shown. See other maps in this Bulletin for current two week temperature anomalies, four week precipitation anomalies, long–term anomalies, and other details.

# UNITED STATES WEEKLY CLIMATE HIGHLIGHTS

*FOR THE WEEK OF JANUARY 7 THROUGH JANUARY 13, 1990.*

Unseasonably mild weather dominated the vast majority of the nation as several Pacific Ocean storms dumped heavy precipitation on the Far West and brought mild semi-tropical air unusually far north. More than a foot of rain drenched parts of the Pacific Northwest Coast while temperatures averaged in excess of 6°F above normal in all but the southeastern and extreme southwestern portions of the country.

Early in the week, a weak storm system across the eastern Gulf Coast intensified and moved northeastward off the mid-Atlantic coast Monday night. Moderate rain and a few thunderstorms moved through the Deep South while rain, sleet and snow fell from the mid-Atlantic and central Appalachians northward into southern New England. Up to 5 inches of snow unexpectedly blanketed northwestern Virginia while nearly a foot buried higher elevations in West Virginia.

Farther west, two intense storm systems moved through the Pacific Coast and rapidly tracked across southern Canada and northeastward up the St. Lawrence Seaway. Both storms brought very heavy precipitation to portions of the Pacific Northwest, especially along the Washington and Oregon coasts, with lesser amounts reported throughout California. In addition, strong winds accompanied the rains in many areas as Astoria, OR set an all-time record when westerly winds gusted to 75 mph. In the higher elevations of the Sierra Nevadas and Cascades, precipitation fell in the form of snow. Several reports of more than two feet were received, and accumulating snow fell as far south as the southern California mountains.

The storms dried out as they moved eastward but retained enough circulation to pull large amounts of very mild air northward ahead of both systems. This resulted in above normal temperatures across most of the lower 48 states. Several dozen daily record maximum temperatures were reported from the desert Southwest to the Appalachians, and readings into the seventies were observed as far north as Nebraska and Colorado (see Figure 1).

Only light rain showers accompanied the passage of these storms and their trailing cold fronts as they moved through the eastern U.S., but a large Canadian high pressure system followed the second disturbance late in the week, bringing at least a temporary end to the spring-like weather that was experienced across the northeastern quarter of the nation. Cooler air began pushing into the northern Plains on Thursday and eventually spread across the northeast and mid-Atlantic by Friday night. Temperatures decreased more than 25°F in one day as northwesterly winds gusted up to 75 mph in some parts of the Midwest, Great Lakes, and Northeast. In addition, another bout of lake-effect snows accompanied the cold surge, burying parts of the snow belt under nearly two feet of new snow.

According to the River Forecast Centers, coastal sections of northern Oregon and southern Washington were drenched by excessive rainfall (up to 14.1 inches) (see Table 1). Severe river flooding afflicted much of this region, but throughout the remainder of the West, precipitation was beneficial. Generally three to six inches of rain fell throughout the western halves of Washington and Oregon while the northern third of California received between 1 and 3 inches. Across the rest of the state, amounts ranged from zero in the Mojave Desert to one or two inches along the central coast.

Although the Far West has experienced some relief in association with the recent precipitation, most states west of the Continental Divide have still received less than two-thirds the normal precipitation since October 1, 1989, according to statewide precipitation averages calculated by the Western Regional Climate Center. In addition, mountain snow water content continues to run well below normal throughout the region, with three states (AZ, NM, OR) reporting less than half the normal snow water content.

Across the rest of the nation, heavy precipitation was limited to scattered stations along the northern Gulf and southern Atlantic Coasts (up to 4.1 inches in extreme eastern Georgia) and south-central Alaska (up to 4.9 inches at Cordova). Light to moderate precipitation fell across the northern and central Rockies, lower Mississippi Valley, East Coast, and Great Lakes region. Little or no precipitation was reported in the southern Rockies, throughout the Plains, in the Tennessee and southern Ohio Valleys, and across southern Florida. In addition, dry weather returned to Hawaii, ending the previous week's short-lived relief from long-term dryness across the easternmost islands.

Most of the country enjoyed exceptionally mild weather as weekly temperature departures in excess of +6°F affected all but the southeastern and extreme southwestern portions of the contiguous 48 states. Parts of the northern Plains observed average temperatures up to 24°F above normal as several stations observed all-time record highs for the month of January (see Table 2). A few locations in the upper Mississippi Valley experienced days with minimum temperatures in excess of the previous record maximum for the date. Only a few locations along the eastern Gulf Coast reported a cooler than normal week.

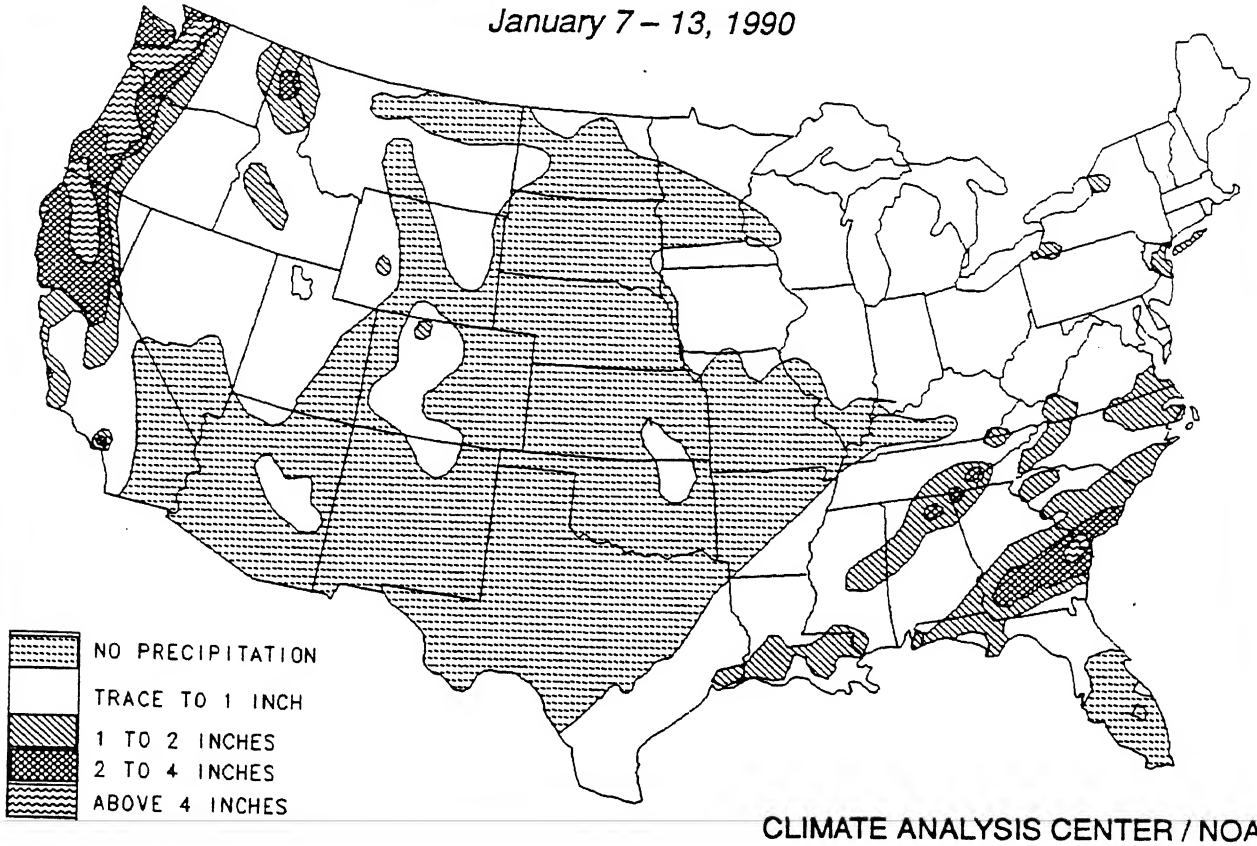
In contrast, most stations in the northern third of Alaska observed a very cold week, despite slightly above normal temperatures across the southern tier of the state (see Table 3). The northernmost stations were most severely affected by the cold outbreak as temperatures averaged 10°F to 15°F below normal across the region. Central Alaska, as well as the entire state of Hawaii, experienced near normal temperatures throughout the week.

**TABLE 1. Selected stations with 2.00 or more inches of precipitation for the week.**

| STATION | TOTAL (INCHES) | STATION | TOTAL (INCHES) |
|---|---|---|---|
| REDDING, CA | 6.66 | VALDEZ, AK | 3.01 |
| OLYMPIA, WA | 6.49 | PORTLAND, OR | 2.95 |
| TACOMA/FT.LEWIS/GRAY AAF, WA | 6.27 | MARYSVILLE/BEALE AFB, CA | 2.93 |
| EUGENE, OR | 6.25 | UKIAH, CA | 2.92 |
| ASTORIA, OR | 6.17 | NORTH BEND, OR | 2.88 |
| TACOMA/MCCHORD AFB, WA | 5.82 | CHARLESTON, SC | 2.87 |
| CORDOVA/MILE 13, AK | 4.87 | BEAUFORT MCAS, SC | 2.86 |
| YAKUTAT, AK | 4.80 | ALBANY, GA | 2.77 |
| SEATTLE-TACOMA, WA | 4.04 | FAIRFIELD/TRAVIS AFB, CA | 2.50 |
| ANNETTE ISLAND, AK | 3.54 | SAVANNAH, GA | 2.44 |
| RED BLUFF, CA | 3.38 | QUILLAYUTE, WA | 2.24 |
| EUREKA, CA | 3.24 | SAVANNAH/HUNTER AFB, GA | 2.04 |
| SACRAMENTO/MC CLELLAN AFB, CA | 3.18 | MEDFORD, OR | 2.02 |
| SACRAMENTO, CA | 3.17 | PASO ROBLES, CA | 2.00 |
| SALEM, OR | 3.06 | SACRAMENTO/MATHER AFB, CA | 2.00 |

## OBSERVED PRECIPITATION

*January 7 – 13, 1990*

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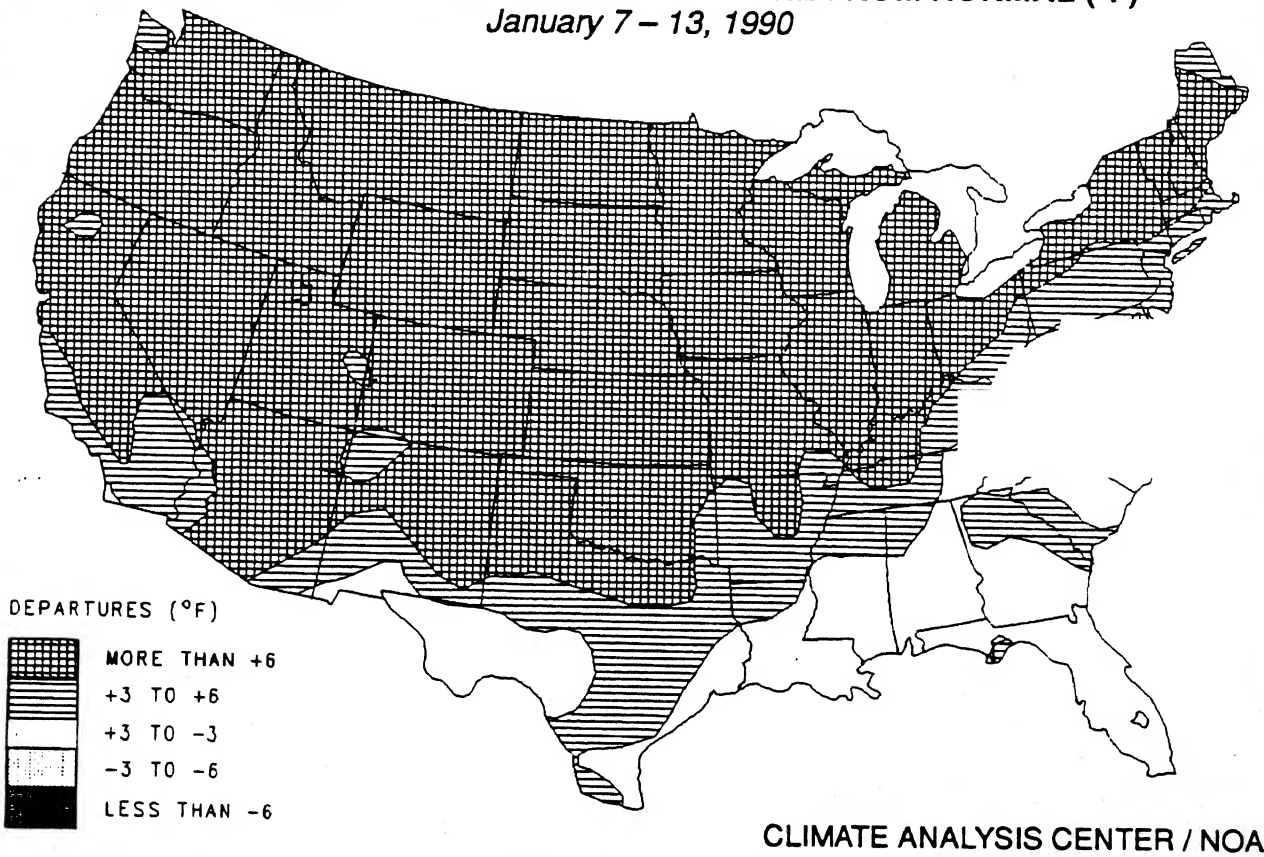
## DEPARTURE OF AVERAGE TEMPERATURE FROM NORMAL (°F)

*January 7 – 13, 1990*

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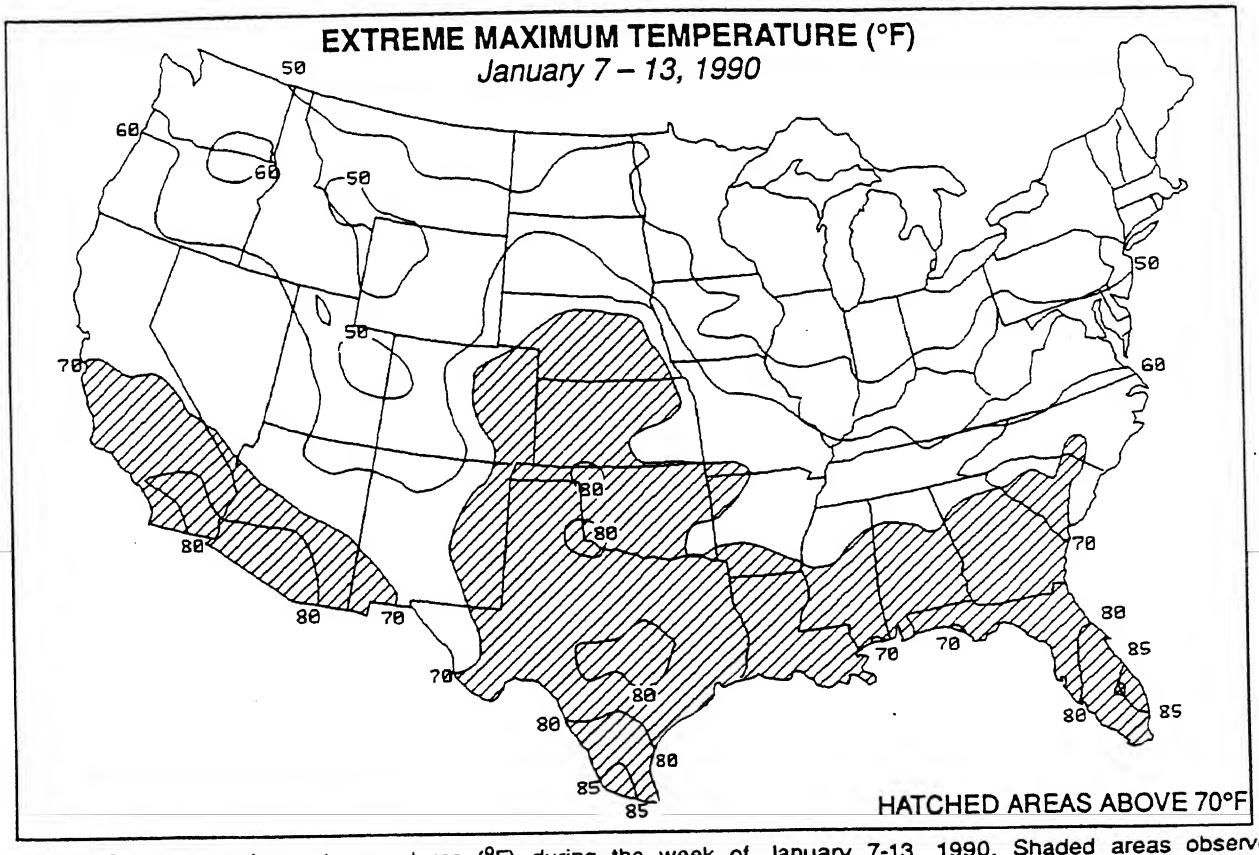


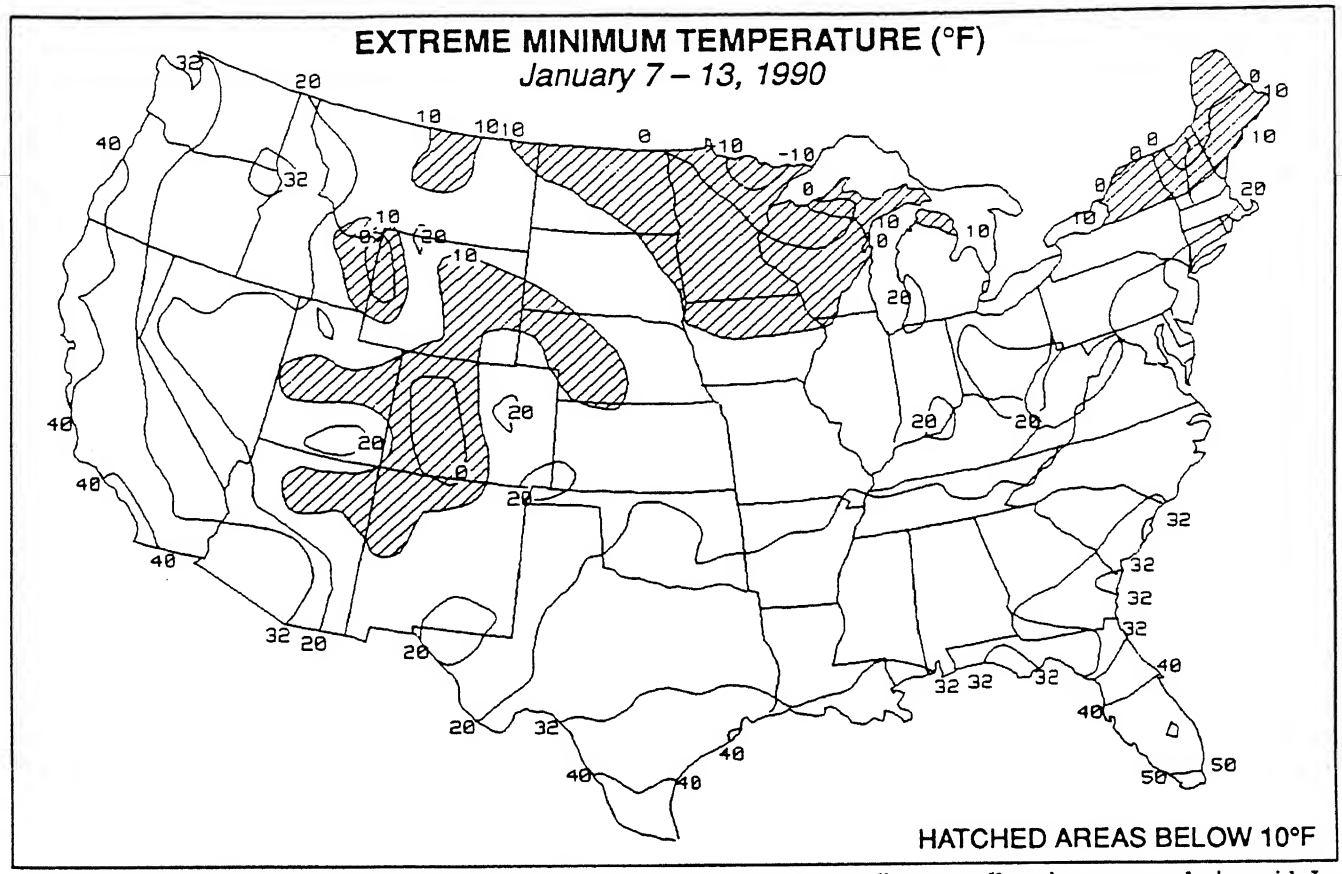

Figure 1. Extreme maximum temperatures (°F) during the week of January 7-13, 1990. Shaded areas observed temperatures in excess of 70°F. Spring-like warmth covered the central and southern Great Plains and the Deep South as highs surpassed 70°F and dozens of daily maximum temperature records were set during the week. Just under a month ago, bitterly cold Arctic air dominated much of the eastern two-thirds of the nation as lows dipped well below 0°F as far south as central Texas and the northern sections of Mississippi and Alabama.

**TABLE 2. Selected stations with temperatures averaging 17.0°F or more ABOVE normal for the week.**

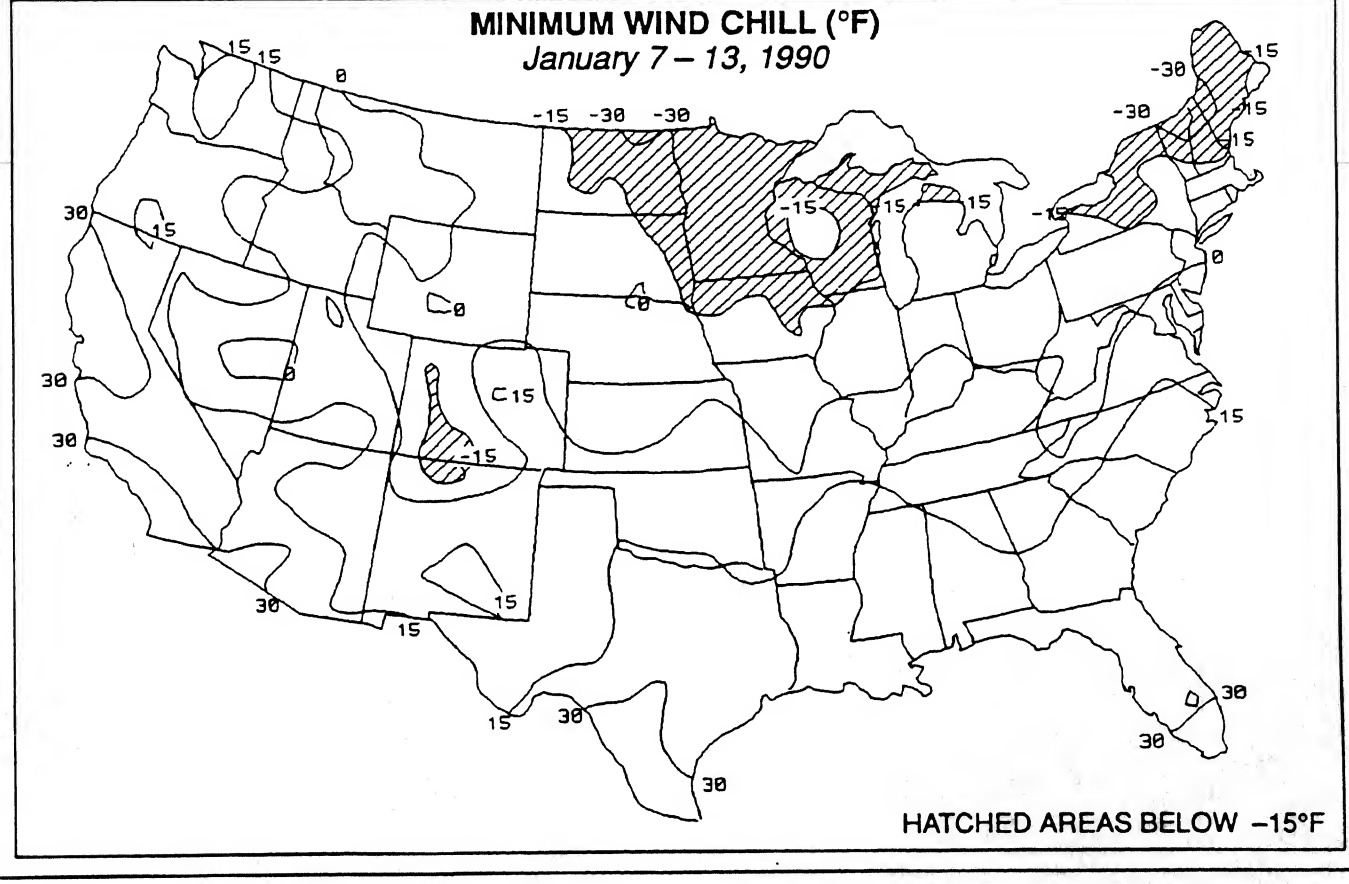
| STATION | DEPARTURE (°F) | AVERAGE (°F) | STATION | DEPARTURE (°F) | AVERAGE (°F) |
|---|---|---|---|---|---|
| BISMARCK, ND | +24.9 | 31.4 | GREAT FALLS, MT | +19.6 | 38.6 |
| JAMESTOWN, ND | +24.6 | 29.7 | IDAHO FALLS, ID | +19.0 | 37.2 |
| MINOT, ND | +23.8 | 29.7 | ALEXANDRIA, MN | +18.8 | 24.2 |
| ABERDEEN, SD | +22.9 | 30.7 | HELENA, MT | +18.7 | 36.6 |
| GLASGOW, MT | +22.6 | 30.8 | BUTTE, MT | +18.7 | 33.6 |
| WILLISTON, ND | +22.6 | 29.4 | SIOUX FALLS, SD | +18.7 | 31.0 |
| DEVIL'S LAKE, ND | +22.5 | 25.9 | BOZEMAN, MT | +18.5 | 34.1 |
| HURON, SD | +22.3 | 33.3 | NORFOLK, NE | +17.9 | 35.2 |
| GRAND FORKS, ND | +22.2 | 24.1 | ROCHESTER, MN | +17.8 | 27.3 |
| FARGO, ND | +22.0 | 26.2 | GRAND ISLAND, NE | +17.7 | 38.2 |
| PIERRE, SD | +21.3 | 36.1 | BILLINGS, MT | +17.5 | 38.2 |
| DICKINSON, ND | +20.7 | 31.4 | LANDER, WY | +17.3 | 36.5 |
| HAVRE, MT | +20.6 | 32.1 | CUT BANK, MT | +17.2 | 31.2 |
| MILES CITY, MT | +20.2 | 33.9 | LINCOLN, NE | +17.1 | 36.5 |
| WATERTOWN, SD | +20.0 | 27.8 | EAU CLAIRE, WI | +17.1 | 26.9 |
| VALENTINE, NE | +19.7 | 37.8 | SPENCER, IA | +17.0 | 29.4 |

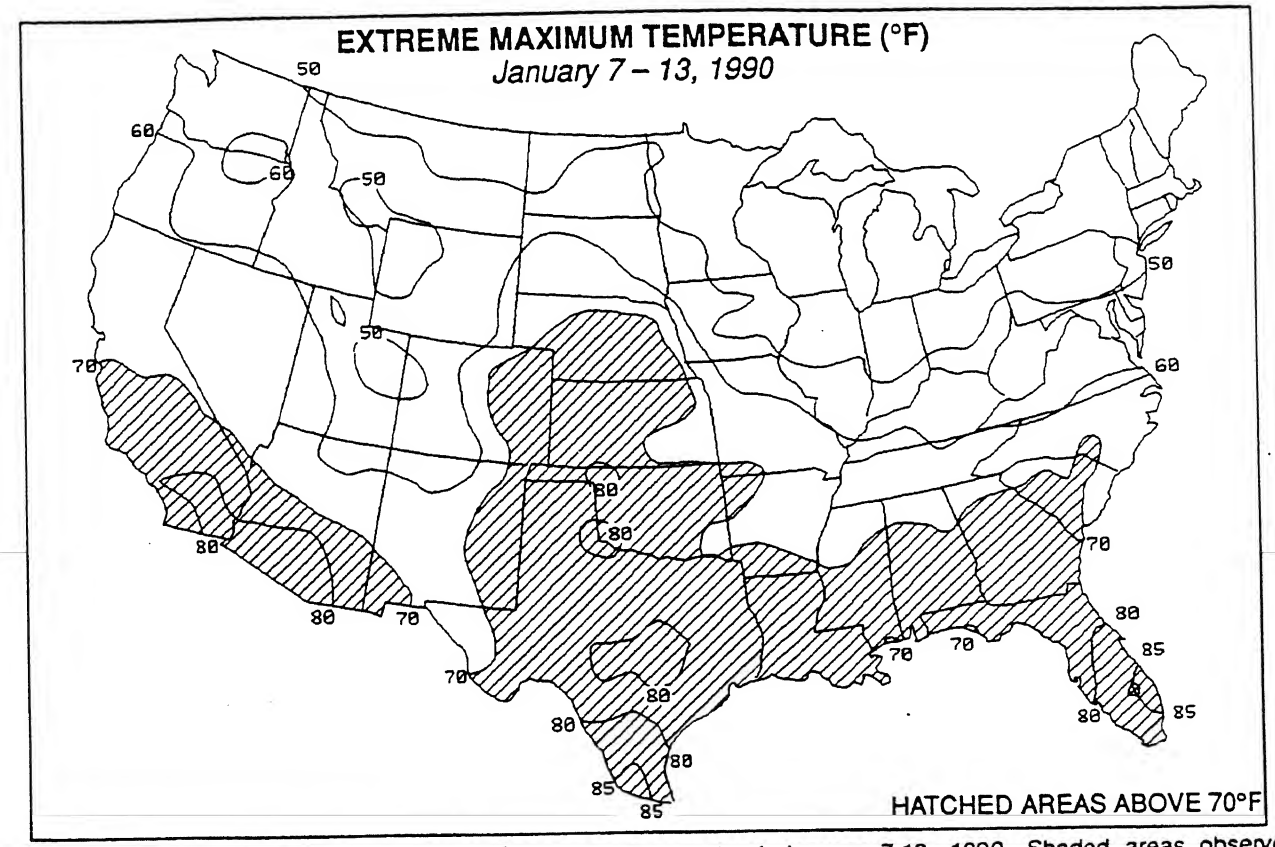
**TABLE 3. Selected stations with temperatures averaging 2.0°F or more BELOW normal for the week.**

| STATION | DEPARTURE (°F) | AVERAGE (°F) | STATION | DEPARTURE (°F) | AVERAGE (°F) |
|---|---|---|---|---|---|
| BARTER ISLAND, AK | -12.2 | -25.9 | KODIAK, AK | -4.8 | 25.1 |
| KOTZEBUE, AK | -11.7 | -14.3 | KING SALMON, AK | -4.2 | 8.2 |
| BARROW, AK | -11.5 | -25.0 | FAIRBANKS, AK | -3.1 | -16.0 |
| BETTLES, AK | -10.2 | -21.4 | ELKINS, WV | -2.5 | 28.8 |
| BETHEL, AK | -7.8 | -2.9 | BIG DELTA, AK | -2.3 | -9.4 |
| ILIAMNA, AK | -5.6 | 8.1 | TALKEETNA, AK | -2.1 | 5.8 |
| FORT YUKON, AK | -4.9 | -25.2 | | | |




The lack of cold Arctic air was evident across the country last week as subzero readings, usually quite common during mid–January, were confined to parts of the upper Midwest and extreme northwestern New England (top). Extremely gusty winds in association with a deep low pressure system in southern Ontario produced dangerous wind chills (less than –15°F) across the northern Great Plains, upper Midwest and western New England (bottom).



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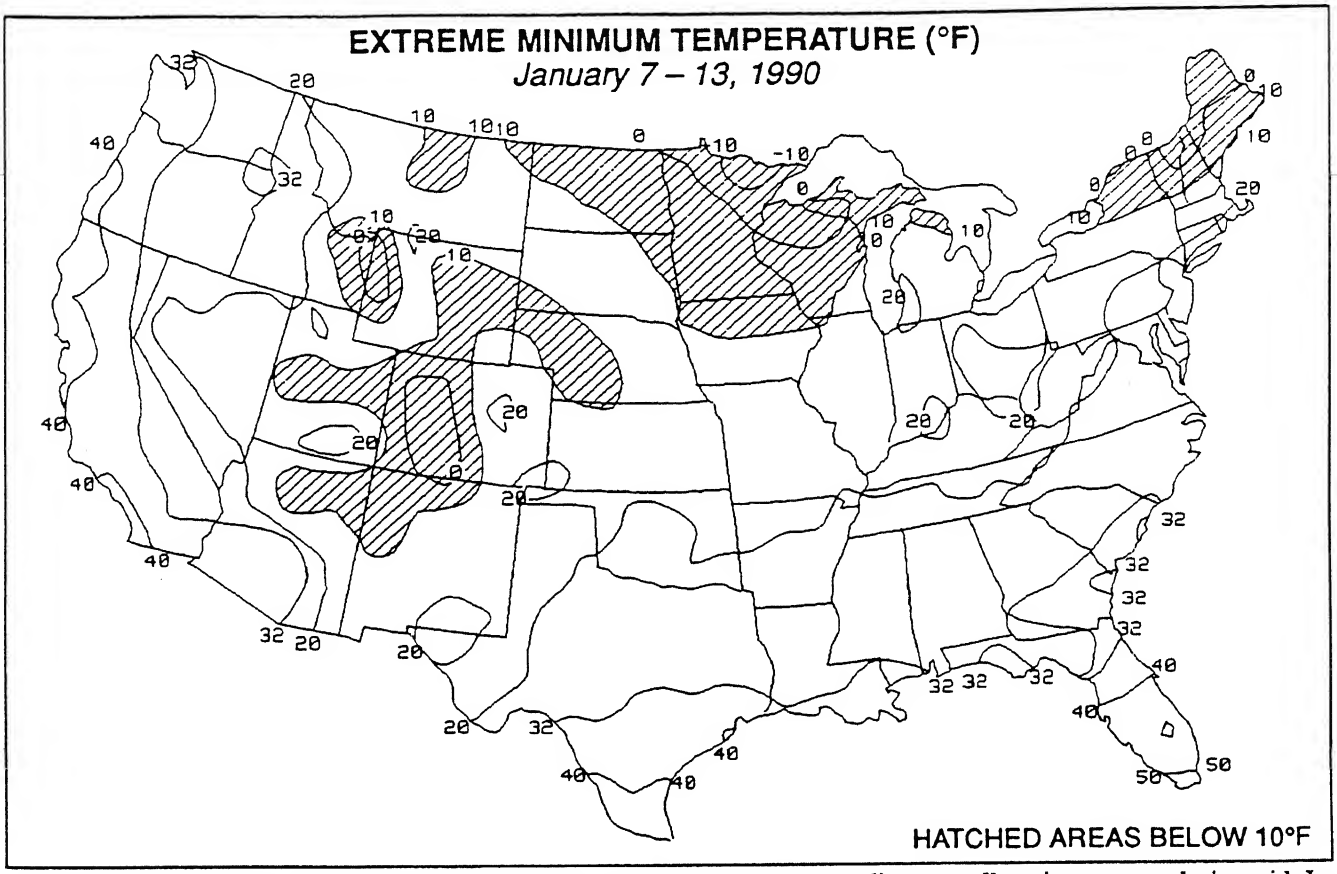


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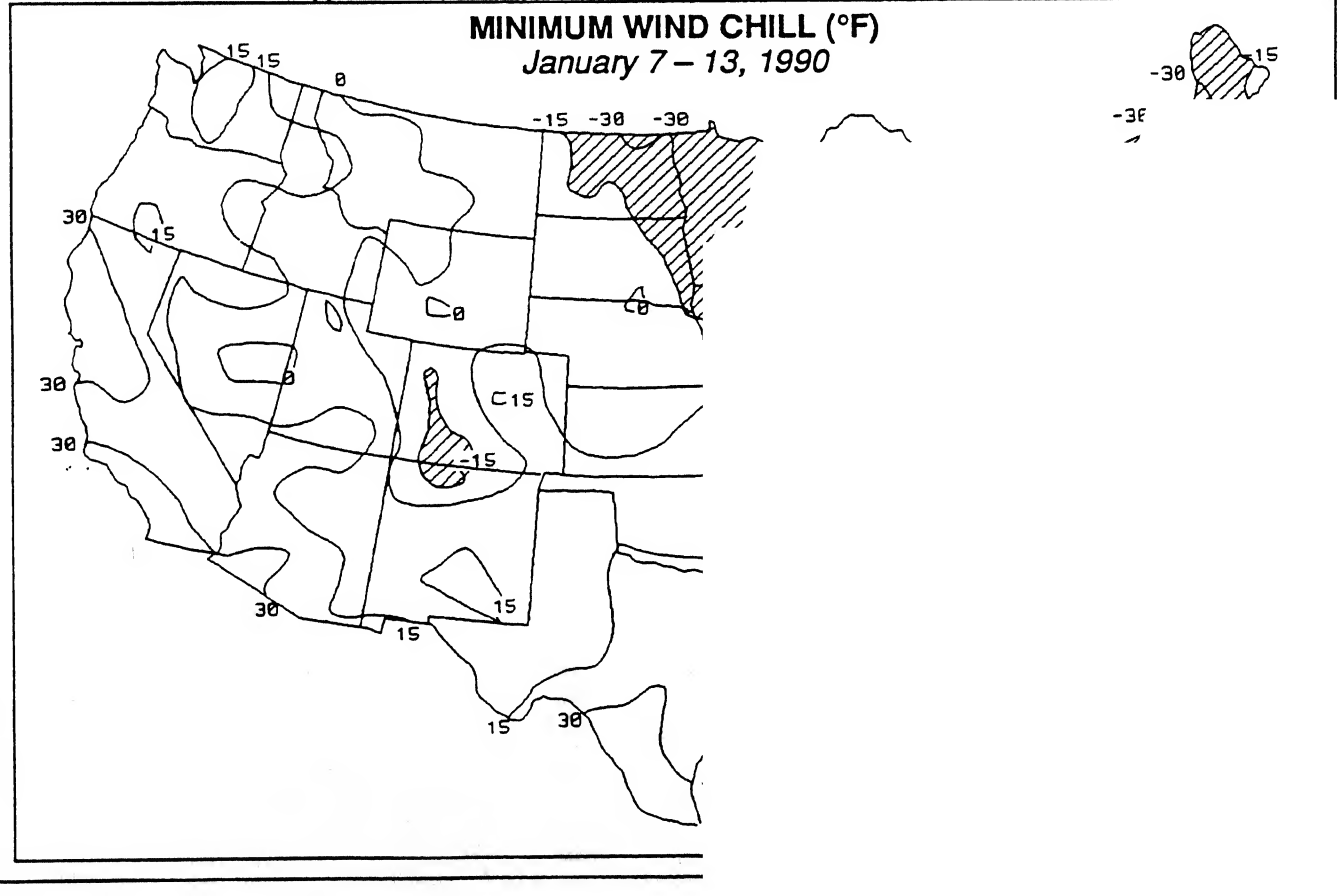
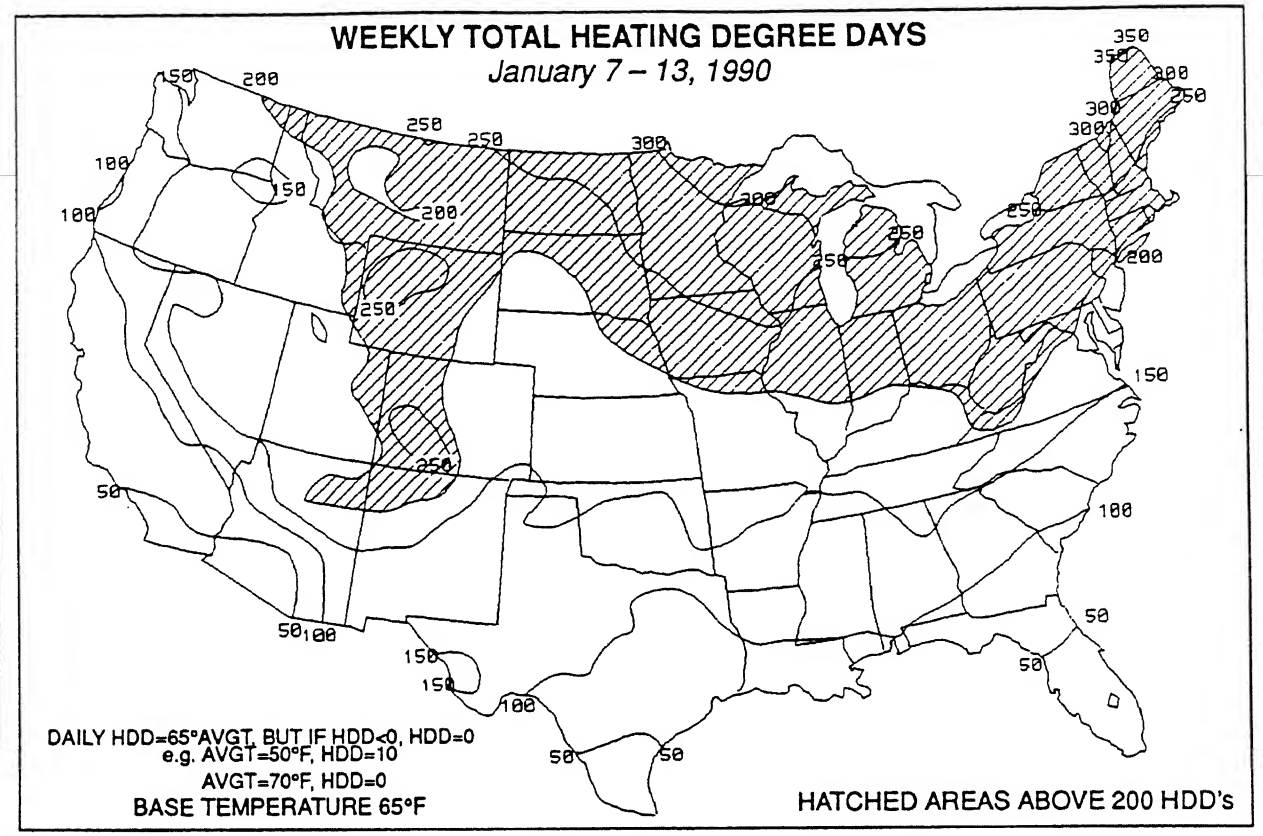
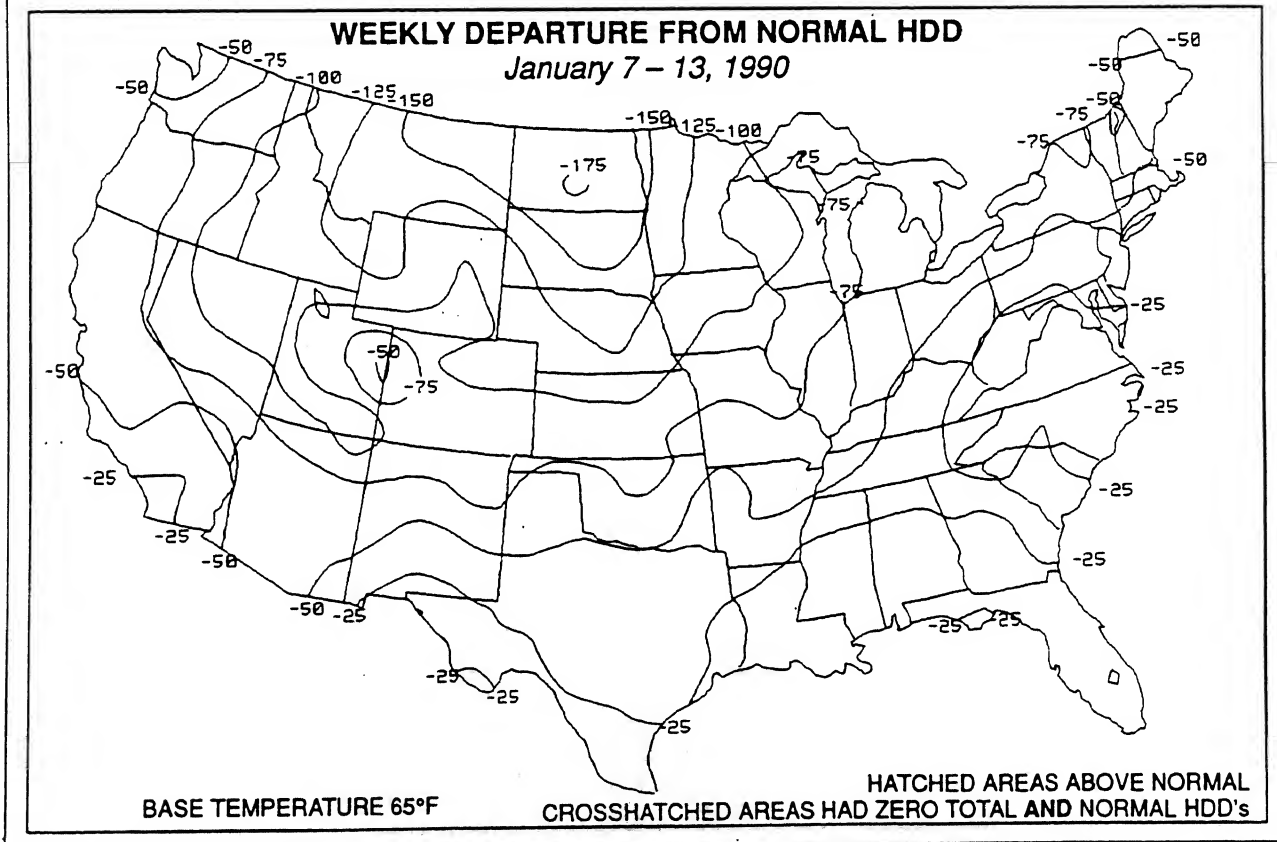


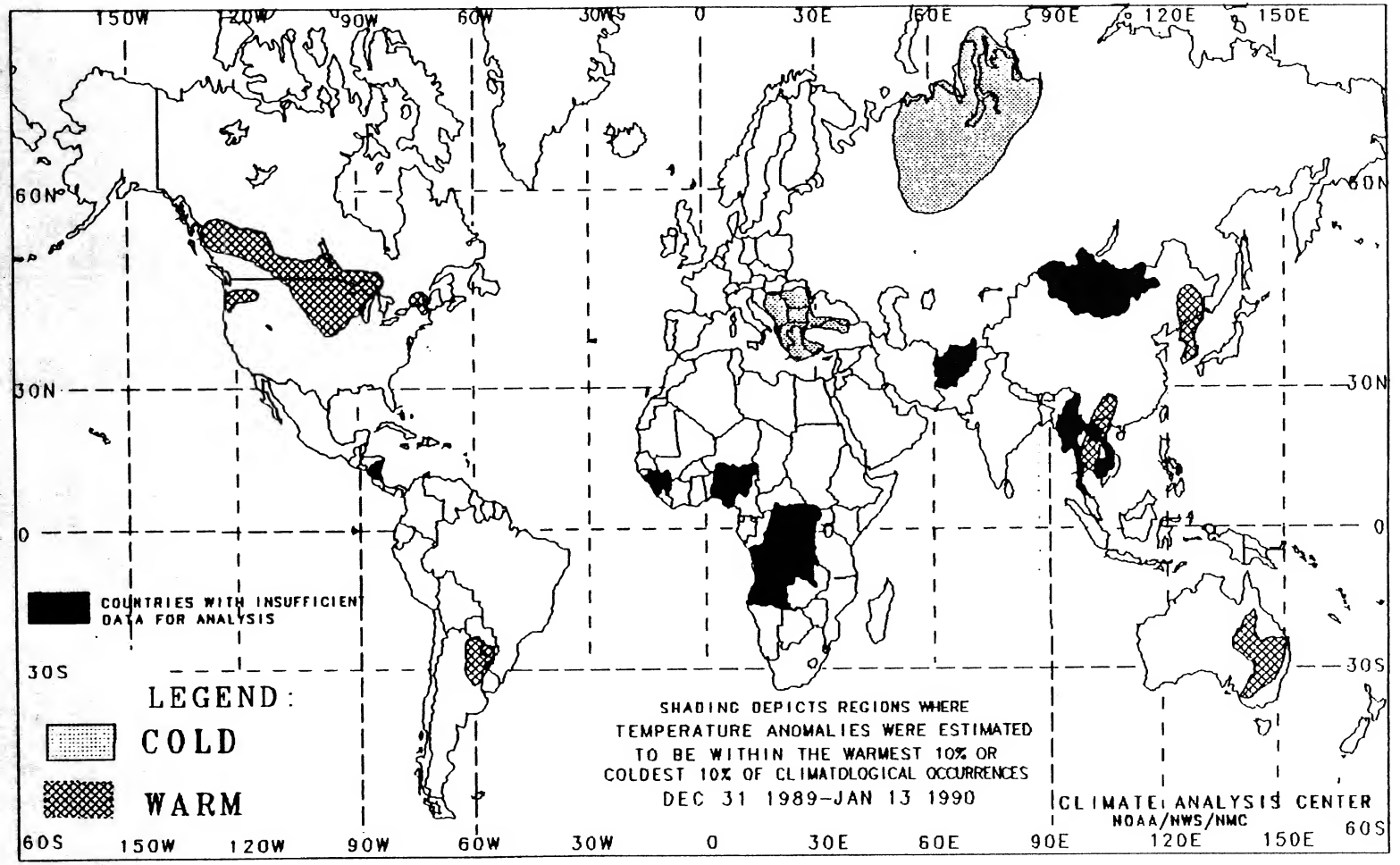



Unseasonably mild weather covered the entire contiguous U. S. last week, greatly reducing the normal heating demand throughout the nation. Weekly heating usage only surpassed 300 HDD's in a few sections of the upper Midwest and northern New England (top) while heating demand was more than 150 HDD's below normal in the northern Plains (bottom).



# GLOBAL TEMPERATURE ANOMALIES

## *2 WEEKS*



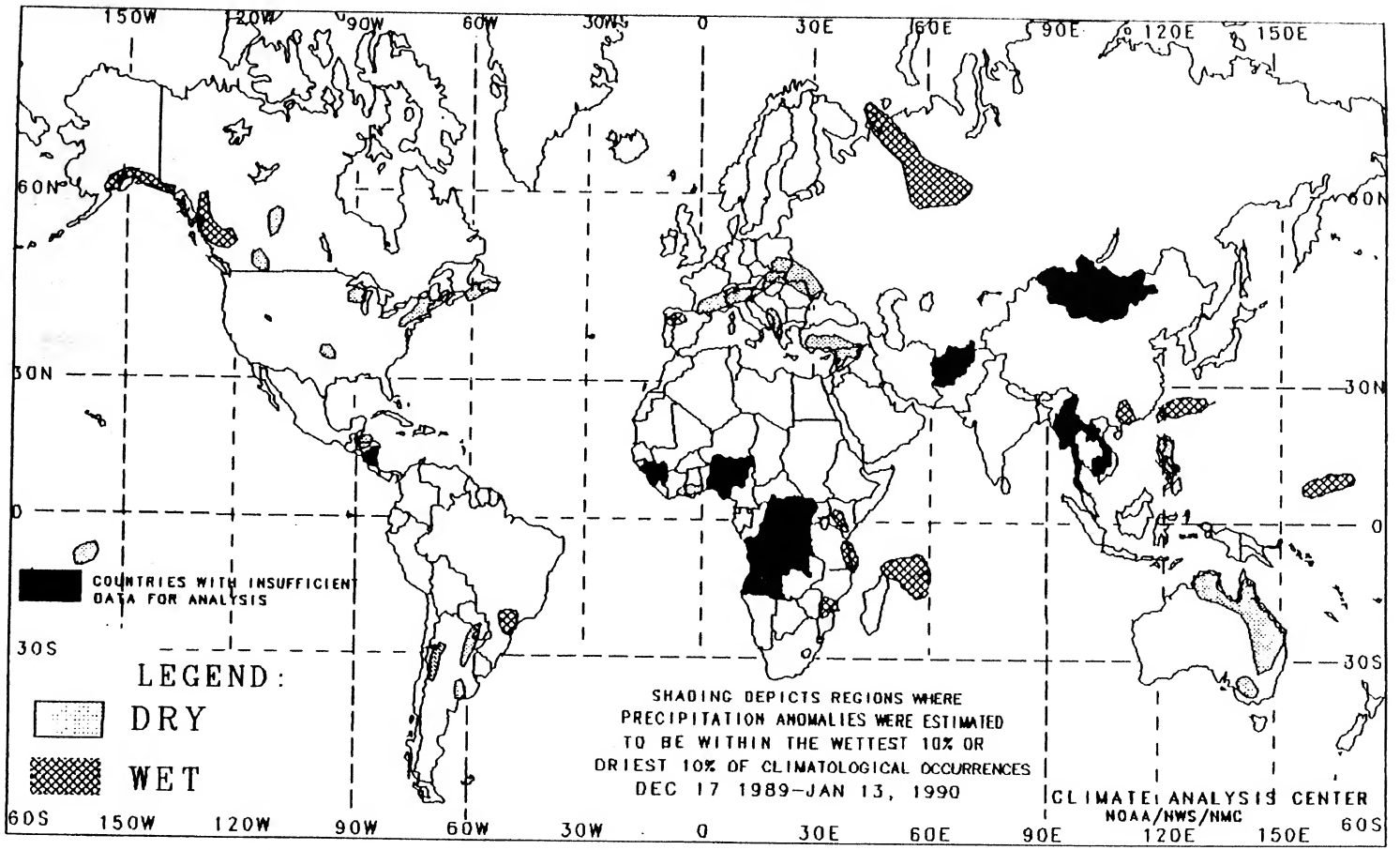

The anomalies on this chart are based on approximately 2500 observing stations for which at least 13 days of temperature observations were received from synoptic reports. Many stations do not operate on a twenty-four hour basis so many night time observations are not taken. As a result of these missing observations the estimated minimum temperature may have a warm bias. This in turn may have resulted in an overestimation of the extent of some warm anomalies.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

This chart shows general areas of two week temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

# GLOBAL PRECIPITATION ANOMALIES

*4 WEEKS*




The anomalies on this chart are based on approximately 2500 observing stations for which at least 27 days of precipitation observations (including zero amounts) were received or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

In climatologically arid regions where normal precipitation for the four week period is less than 20 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total four week precipitation exceeds 50 mm.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of four week precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

# ANNUAL CLIMATE SUMMARY

## *MAJOR CLIMATIC EVENTS AND ANOMALIES IN THE UNITED STATES DURING 1989*

*1. Central United States:*

### LONG–TERM PRECIPITATION DEFICITS OCCUR.

Unseasonably dry weather spread across the north central United States during March and April. Rains were spotty during May as dryness spread across the central United States. Heavy showers in late May were not intense enough or widespread enough to eliminate long–term precipitation deficits in most areas. Scattered rain showers continued into June and July; however, few areas received consistent rains. By the end of July rains became more widespread and brought short–term relief, but long–term rainfall deficits remained.

*2. Eastern United States:*

### UNSEASONABLY WET WEATHER PREVAILS FROM MAY THROUGH JULY.

May began with very heavy rains, over 300 mm in the first week of the month, in the Southeast and along the Atlantic coast. The very wet weather covered the entire eastern third of the continental United States and brought flooding to the Ohio River Valley late in May. After a brief break in early June the rains returned. Tropical Storm Allison brought extremely heavy rains, up to 600 mm, during the last week of June, as the persistently wet weather regime continued. During July the rainy conditions tapered off and by the end of the month conditions returned to near normal.

*3. Central United States:*

### MORE DRYNESS AT THE END OF THE YEAR.

Very little precipitation has occurred across the nation's midsection, particularly the Great Plains and the Lower Mississippi Valley, during much of October, November, and December. Significant precipitation was reported in Kansas, Oklahoma, and Texas as November began. Short–term deficits eased as very cold weather and occasional moderate precipitation occurred in the central Great Plains during late December; however, long–term moisture deficits persisted.

*4. Coastal Sections of Alaska:*

### DRY SPELL PREVAILS DURING SPRING.

Very dry conditions developed during March along the southeast coast of Alaska. By April the unusually dry weather spread across the southern Alaskan coast to the Alaska Peninsula as the jet stream shifted northward and eastward. In May rains returned to southern Alaska; however, the Panhandle continued to experience a lack of rain. A frontal system stalled across the region in late May and early June and provided welcome relief from the dry spell.

*5. Eastern and Central United States:*

### VERY WET AUGUST THROUGH OCTOBER.

Abundant rainfall left the soil saturated in many parts of the east central United States during late August and early September. By the middle of September abnormally wet conditions extended further south and east. Hurricane Hugo inundated the Carolinas while very dry conditions developed in the central United States. Excessive rains at the end of September and early October were reported in the eastern states. After a brief respite from the rain during the middle of October more wet weather occurred across the East. Precipitation remained plentiful until the end of October and the beginning of November when drier conditions and delightful autumn weather brought an end to the abnormally wet regime.

*6. Alaska and Entire United States East of the Rockies:*

### BITTER COLD DOMINATES ALASKA IN NOVEMBER, EASTERN U.S. IN DECEMBER.

After bitterly cold Arctic air covered most of Alaska during November, a change in the upper–air pattern sent record–breaking cold into the United States during late November which stagnated over New England in early December. Another Arctic blast penetrated the United States, surged all the way to Florida and the Gulf of Mexico, and tightened winter's grip on the United States. At the end of the year temperatures began to moderate as a record–breaking cold December came to a close.

*7. Southeastern and Eastern United States:*

### VERY DRY JANUARY TO EARLY MARCH.

Unusually dry conditions developed across the eastern United States during January. Many stations on the East Coast had less than half their normal rainfall since December. In the middle of February heavy snow fell in the eastern United States and by the end of the month only Florida remained abnormally dry. During March heavy rain showers brought relief to Florida.

*8. Northwestern United States:*

### LARGE PRECIPITATION DEFICITS DURING RAINY SEASON.

The rainy season normally reaches its maximum during the winter months (December – February). Abnormally dry conditions developed in early January and persisted through February. By the middle of March short–term precipitation amounts were near normal, but long–term deficits remained.

*9. Texas:*

### EARLY SEASON HEAT WAVE DURING JUNE.

Very high temperatures, with several stations reporting values above 40°C or more, developed at the end of May and persisted into early June. By the middle of June the heat wave abated as near normal temperatures returned.

*10. Alaska:*

### LATE SUMMER WARM SPELL.

Unusually warm conditions developed in Alaska during early August as the upper air flow brought abnormally warm air into the state. The high temperatures ended when stormy weather resulted in a cool, wet regime.

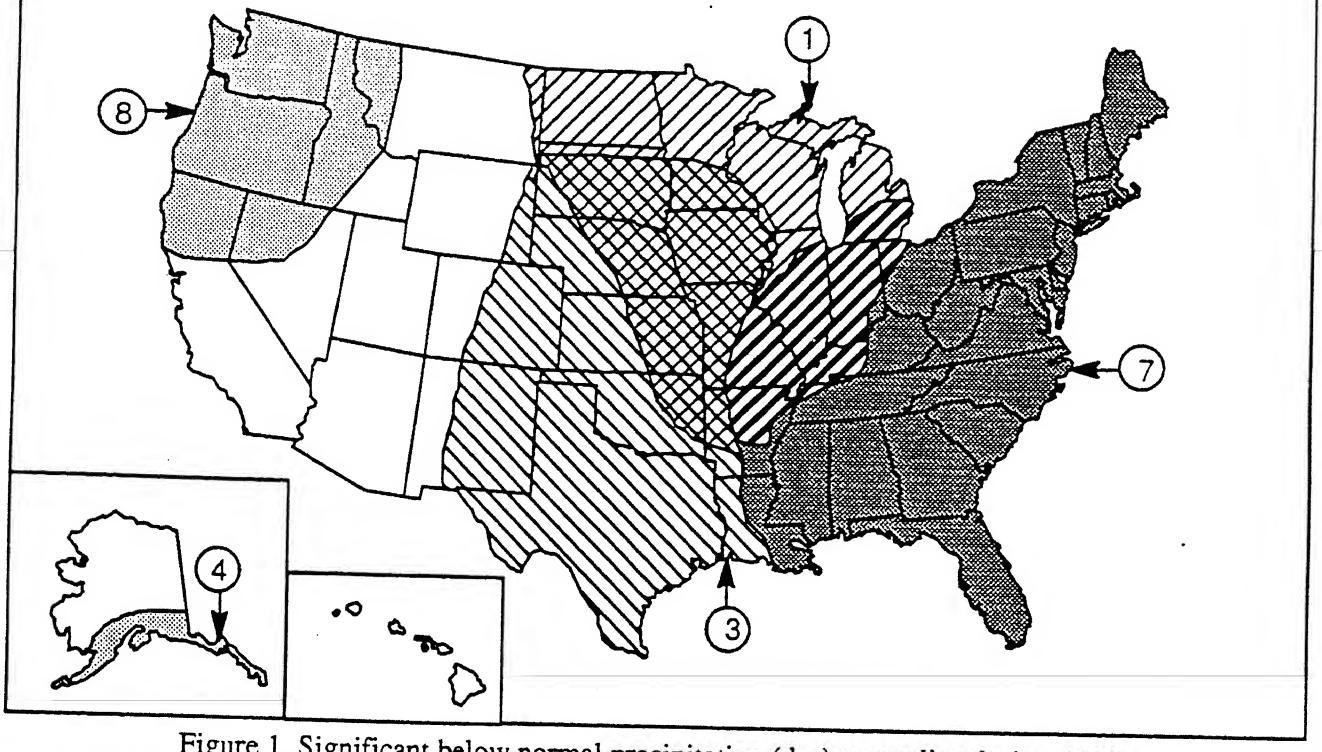



Figure 1. Significant below normal precipitation (dry) anomalies during 1989.

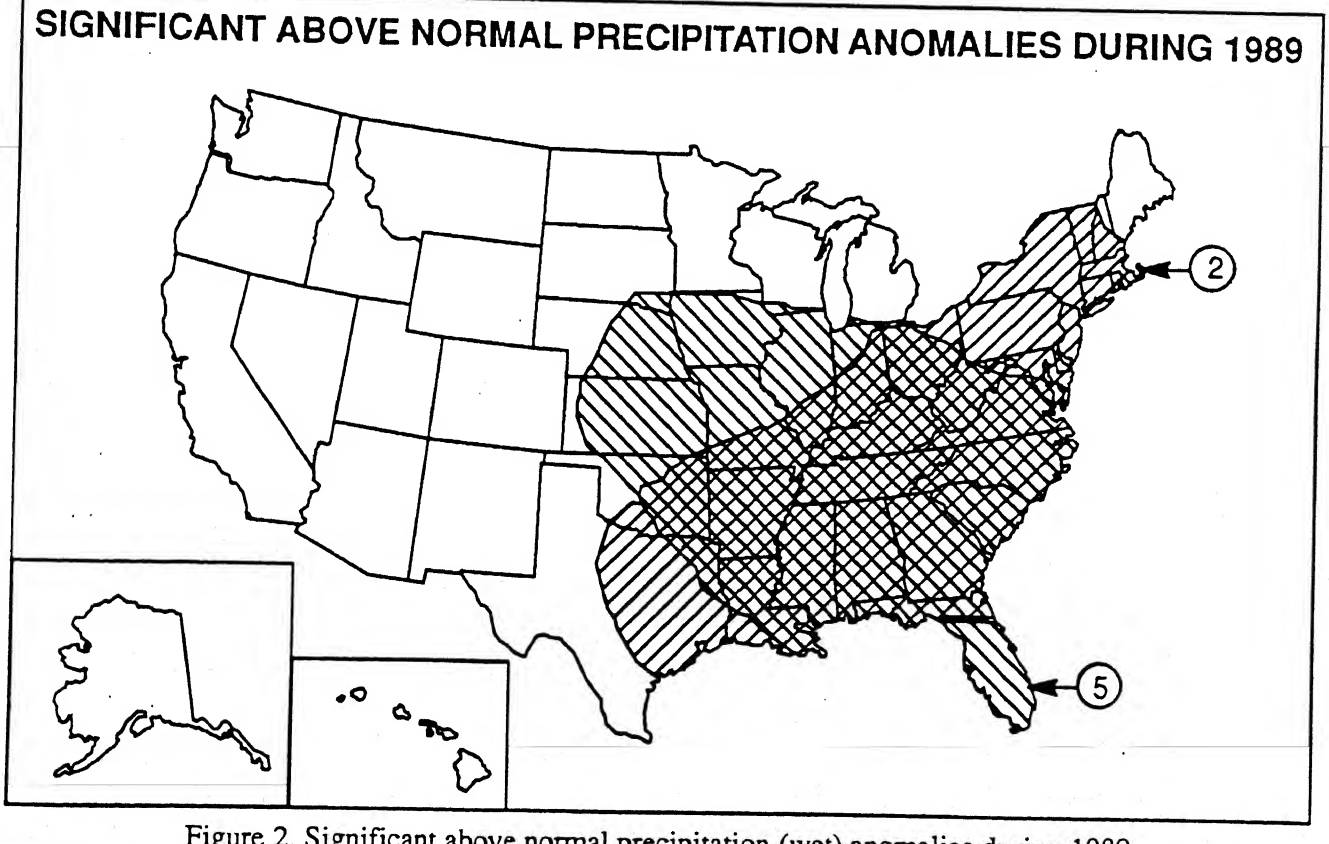



Figure 2. Significant above normal precipitation (wet) anomalies during 1989.

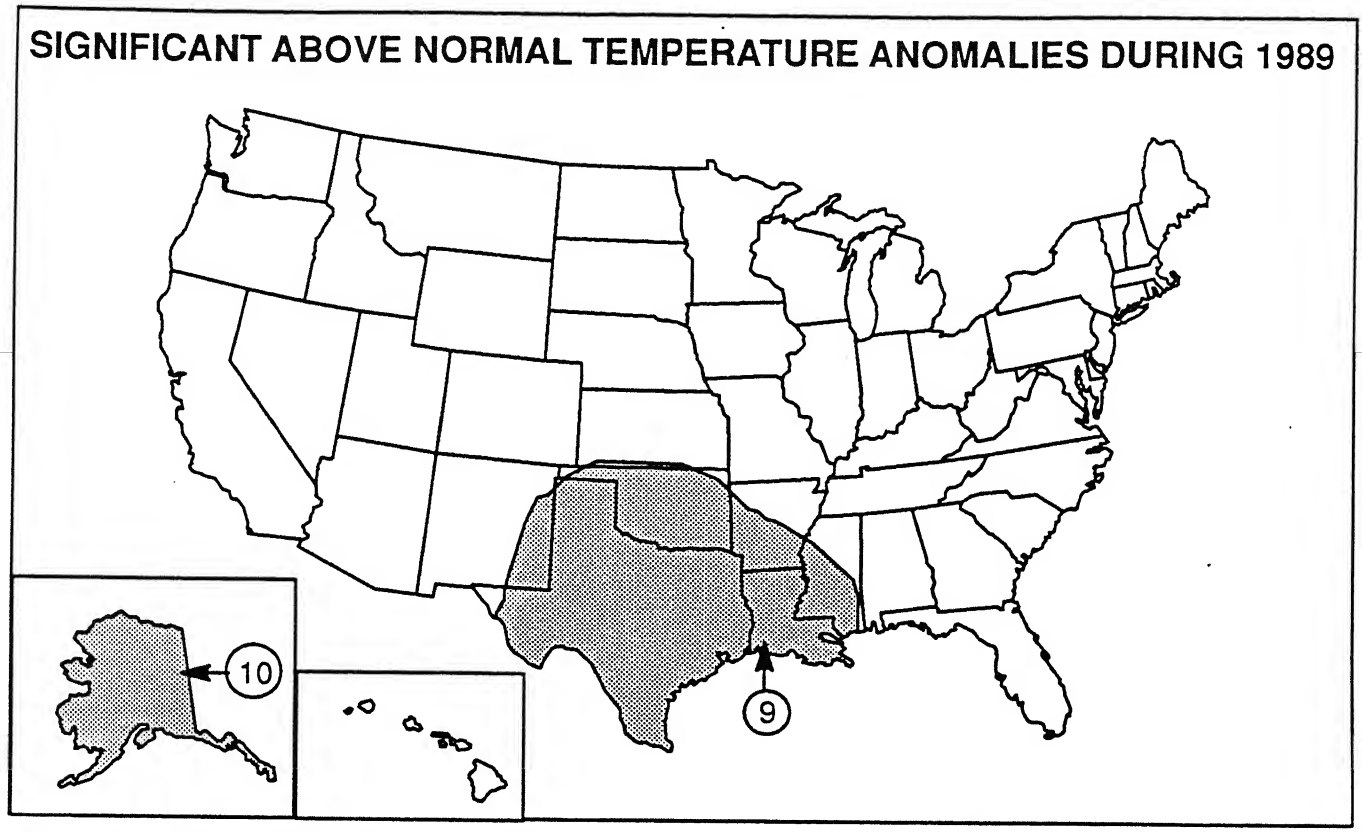



Figure 3. Significant above normal temperature (warm) anomalies during 1989.

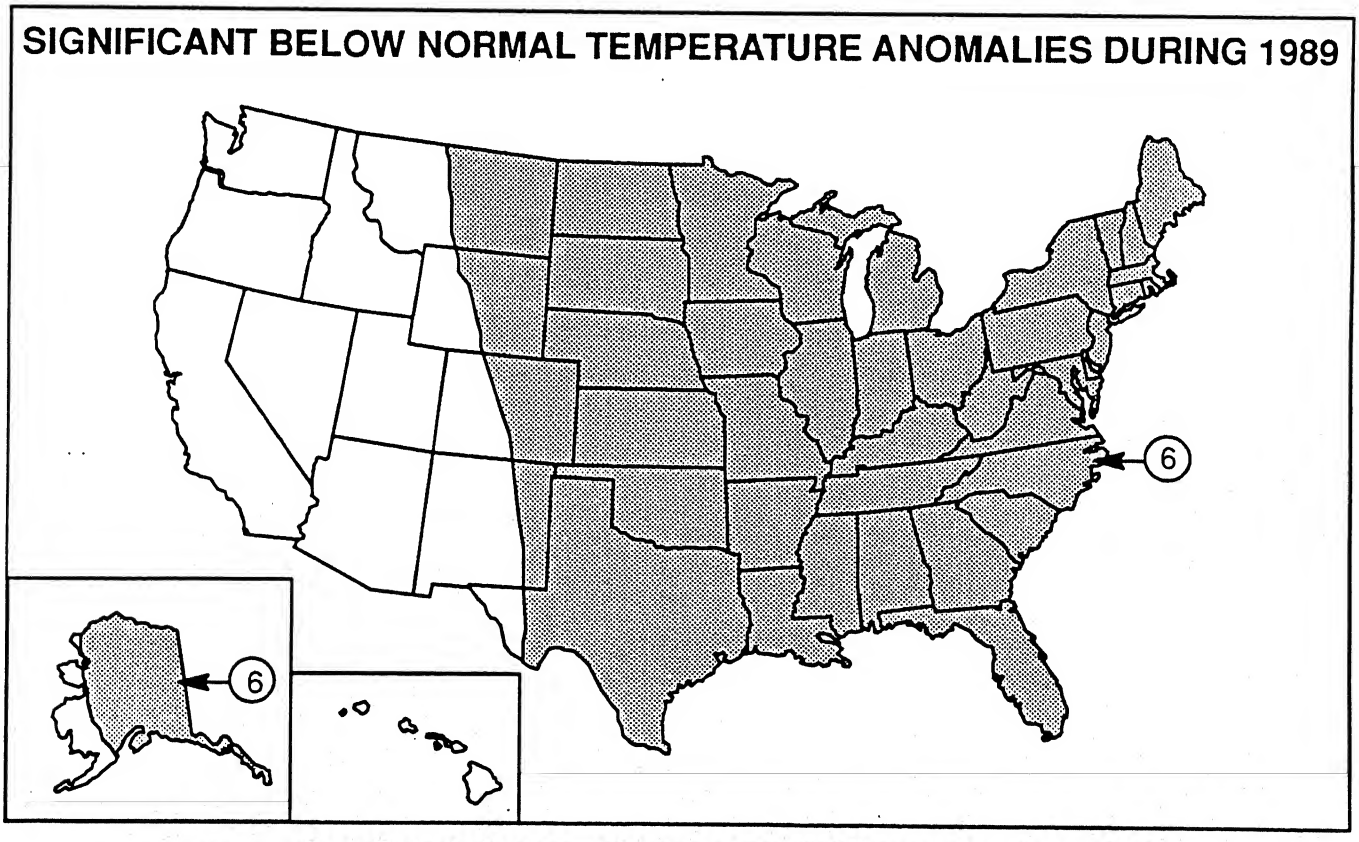



Figure 4. Significant below normal temperature (cold) anomalies during 1989.

## TEMPERATURE AND PRECIPITATION RANKINGS FOR THE YEAR 1989, BASED ON THE PERIOD 1895 – 1989 (95 YEARS) WHERE 1=DRIEST/COLDEST AND 95=WETTEST/HOTTEST

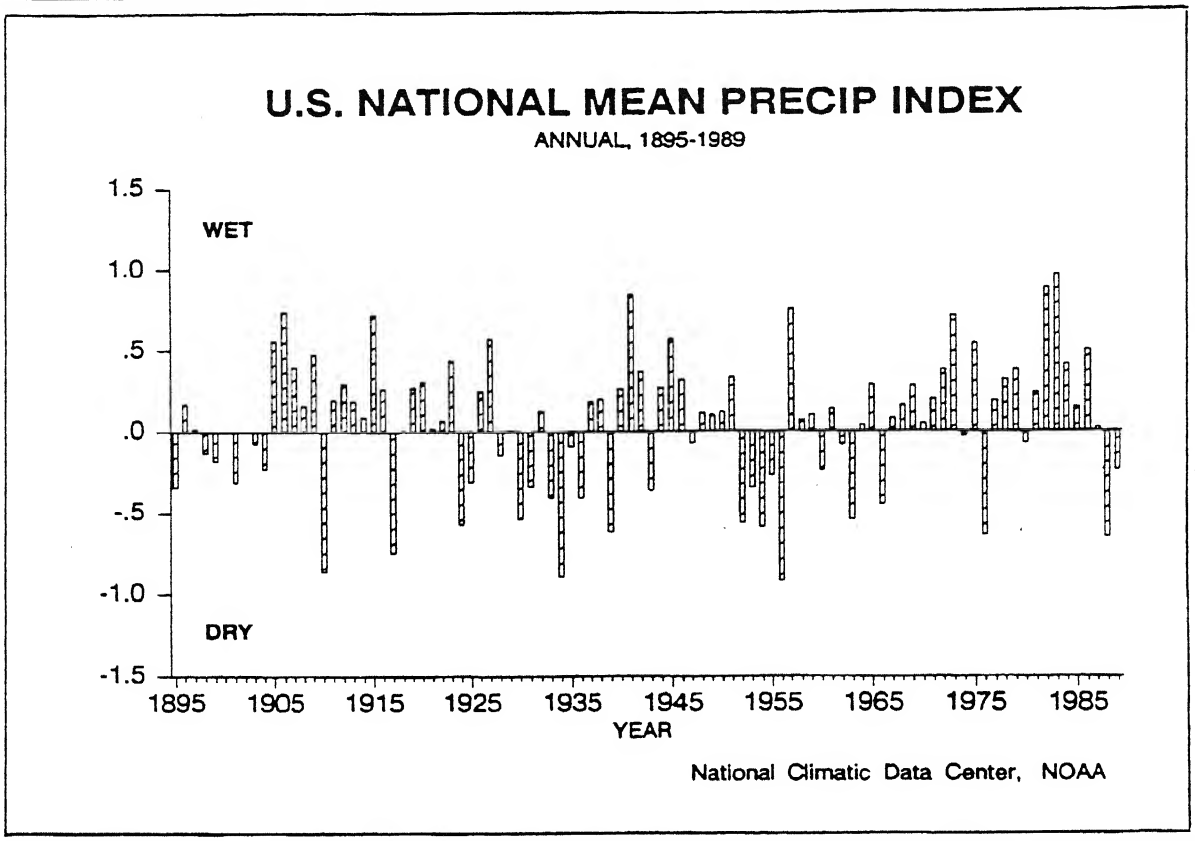
| *REGION* | *PRECIPITATION* | *TEMPERATURE* |
|---|---|---|
| NORTHEAST | 82 | 16 |
| EAST NORTH CENTRAL | 7 | 13 |
| CENTRAL | 69 | 11 |
| SOUTHEAST | 87 | 32 |
| WEST NORTH CENTRAL | 26 | 46 |
| SOUTH | 56 | 17 |
| SOUTHWEST | 5 | 89 |
| NORTHWEST | 21 | 54 |
| WEST | 6 | 72 |
| NATIONAL | 24 | 36 |

*National Climatic Data Center*

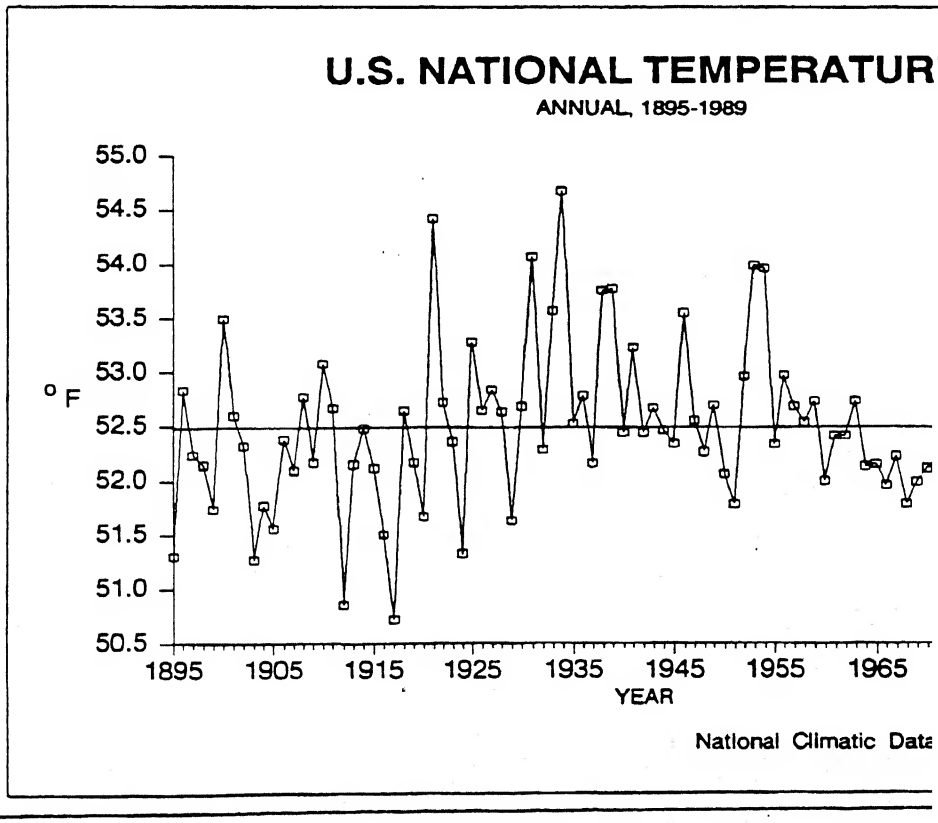
## PRECIPITATION RANKINGS FOR THE YEAR 1989, BASED ON THE PERIOD 1895 – 1989 (95 YEARS) WHERE 1=DRIEST AND 95=WETTEST

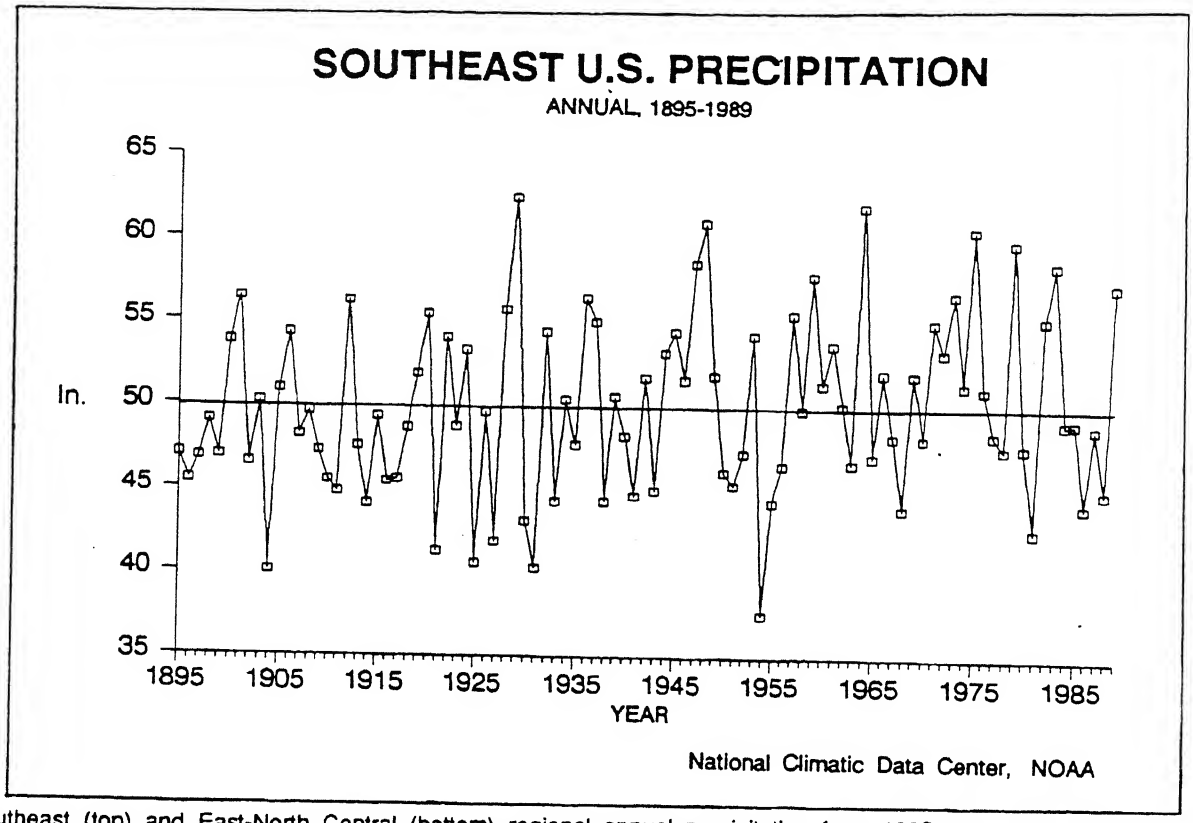
| *STATE* | *RANK* | *STATE* | *RANK* | *STATE* | *RANK* | *STATE* | *RANK* |
|---|---|---|---|---|---|---|---|
| AL | 88 | IA | 7 | NE | 7 | RI | 91 |
| AZ | 5 | KS | 45 | NV | 20 | SC | 80 |
| AR | 65 | KY | 93 | NH | 64 | SD | 35 |
| CA | 7 | LA | 76 | NJ | 91 | TN | 91 |
| CO | 8 | ME | 36 | NM | 17 | TX | 34 |
| CT | 92 | MD | 90 | NY | 82 | UT | 5 |
| DE | 94 | MA | 80 | NC | 93 | VT | 73 |
| FL | 34 | MI | 12 | ND | 11 | VA | 91 |
| GA | 78 | MN | 23 | OH | 85 | WA | 24 |
| ID | 27 | MS | 85 | OK | 63 | WV | 94 |
| IL | 13 | MO | 12 | OR | 13 | WI | 7 |
| IN | 78 | MT | 79 | PA | 81 | WY | 28 |

*National Climatic Data Center*

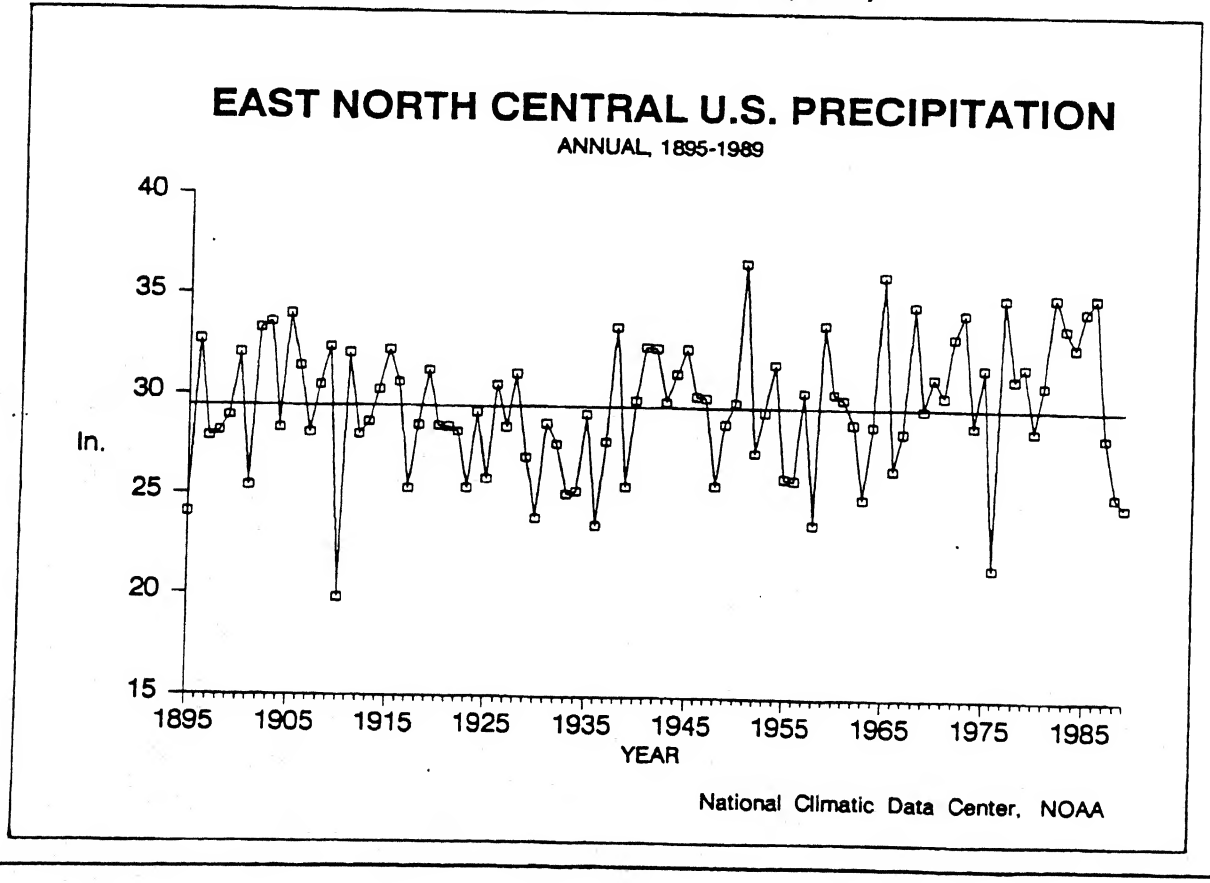



U.S. National Annual 1989 mean precipitation index (top) and temperature (bottom). The annual precipitation for each climate division in the country (total of 344) was first standardized over the 1951-1980 period, then weighed by area and averaged to determine a national standardized precipitation value. Negative (positive) values are dry (wet). Based upon the index, the 1989 precipitation was below the long-term mean (the 24th driest year during the past 95 years). The annual precipitation for the past three years have been below the long-term mean, contrasting sharply from the wetter pattern of 1981-1986. 1989 temperatures across the contiguous U.S. averaged slightly below the long-term mean, ranking as the 36th coldest year on record (since 1895) due in part to an extremely cold December. This year also continued the decreasing trend in the national annual temperature the last three years.






Southeast (top) and East-North Central (bottom) regional annual precipitation from 1895-1989. After 5 consecutive years with subnormal precipitation in the Southeast, extremely wet weather during the late spring, summer, and autumn months pushed yearly totals well above normal, ranking 1989 as the 9th wettest year since 1895. Similarly, the Northeast region, after an unusually dry January and February, received heavy precipitation in May. The wet weather pattern then continued well into the year and made 1989 the 14th wettest year on record (not shown). In sharp contrast, this year marked the third successive year with subnormal precipitation in the East-North Central region, ranking as the 7th driest year on record. Other regions with significant dryness this year included the Southwest and West, ranked 5th and 6th driest, respectively.



# STATEWIDE RECORDS IN 1989

## BASED ON STATEWIDE AVERAGED DATA DURING THE PERIOD 1895 – 1989

### RECORD WETNESS

| PERIOD OF RECORD | AFFECTED STATES |
|---|---|
| FEBRUARY | KY |
| MAY | MD, PA |
| JUNE | AL, LA |
| JANUARY – NOVEMBER | DE, WV |
| FEBRUARY – SEPTEMBER | DE, NJ, TN, VA, WV |
| MAY – SEPTEMBER | DE, LA, MI, NJ, NY, RI, TN, VA, WV |

### RECORD DRYNESS

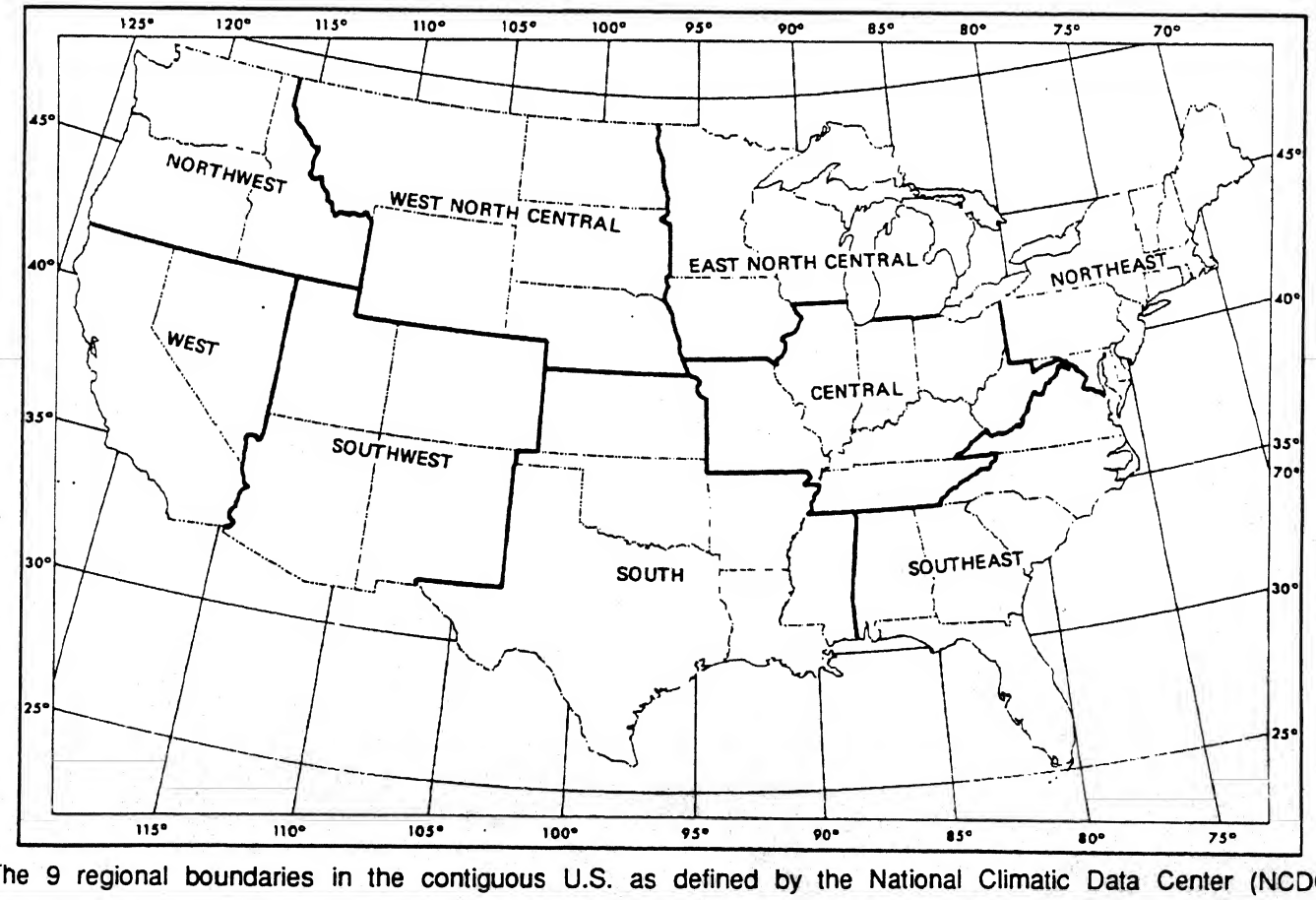
| PERIOD OF RECORD | AFFECTED STATES |
|---|---|
| APRIL | AZ, KS, MO, OK |
| NOVEMBER | KS, OK |
| DECEMBER | CA, MA |

### RECORD WARMTH

| PERIOD OF RECORD | AFFECTED STATES |
|---|---|
| APRIL | AZ, UT |
| JULY | UT |

### RECORD COLD

| PERIOD OF RECORD | AFFECTED STATES |
|---|---|
| DECEMBER | CT, DE, IN, KY, ME, MD, MI, NH, NJ, NY, OH, PA, RI, VT, WV |

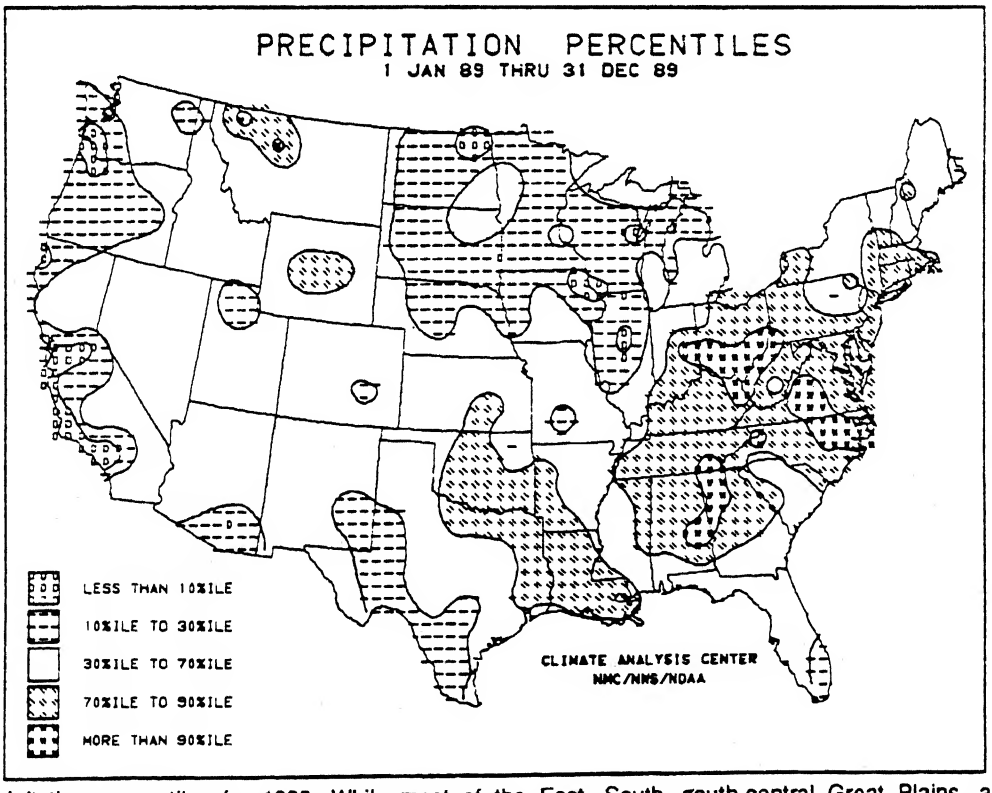



The 9 regional boundaries in the contiguous U.S. as defined by the National Climatic Data Center (NCDC).

**TABLE 1. SELECTED STATIONS WITH MORE THAN 125% OF NORMAL PRECIPITATION AND MORE THAN 20 INCHES OF PRECIPITATION; OR, STATIONS WITH MORE THAN 60 INCHES OF PRECIPITATION AND NO NORMALS DURING 1989.**

| STATION | TOTAL (INCHES) | PCT. OF NORMAL | STATION | TOTAL (INCHES) | PCT. OF NORMAL |
|---|---|---|---|---|---|
| HILO/LYMAN, HAWAII, HI | 64.14 | 128.3 | NEW YORK/KENNEDY, NY | 55.96 | 134.0 |
| CORDOVA/MILE 13, AK | 22.88 | 135.6 | LIHUE, KAUAI, HI | 55.79 | 127.4 |
| KOKEE, KAUAI, HI | 94.74 | 148.5 | LYNCHBURG, VA | 55.46 | 138.9 |
| CAPE HATTERAS, NC | 90.57 | 162.8 | NEW YORK/LA GUARDIA, NY | 54.63 | 128.3 |
| BATON ROUGE, LA | 87.39 | 156.7 | ROANOKE, VA | 54.31 | 139.5 |
| VALDEZ, AK | 84.76 | 142.1 | RALEIGH-DURHAM, NC | 53.76 | 129.4 |
| MILTON/WHITING NAS, FL | 82.04 | *** | NEWARK, NJ | 53.12 | 126.1 |
| MONTGOMERY, AL | 74.67 | 152.6 | PARKERSBURG/WOOD CO., WV | 53.06 | 140.5 |
| HUNTSVILLE, AL | 72.43 | 132.4 | INDIANAPOLIS, IN | 50.76 | 130.6 |
| CHATTANOOGA, TN | 71.80 | 136.4 | WASHINGTON/NATIONAL, DC | 50.30 | 129.7 |
| MERIDIAN, MS | 70.31 | 131.8 | DAYTON, OH | 49.37 | 143.2 |
| SHREVEPORT/BARKSDALE AFB, LA | 64.72 | *** | OKLAHOMA CITY, OK | 40.87 | 132.9 |
| COLUMBUS AFB, MS | 64.70 | *** | KAHALUI, MAUI, HI | 40.43 | 222.7 |
| MCCOMB, MS | 63.95 | *** | DALLAS/FORT WORTH, TX | 39.81 | 128.1 |
| JACKSON, KY | 63.29 | 143.9 | WICHITA FALLS, TX | 36.63 | 138.3 |
| ATLANTA, GA | 63.27 | 130.8 | ILIAMNA, AK | 35.81 | 141.4 |
| DOVER AFB, DE | 62.88 | 141.6 | TALKEETNA, AK | 34.34 | 125.2 |
| SHREVEPORT, LA | 60.91 | 139.4 | ANCHORAGE, AK | 27.85 | 187.3 |
| ASHEVILLE, NC | 60.52 | 138.4 | KING SALMON, AK | 24.34 | 127.4 |
| PANAMA CITY/TYNDALL AFB, FL | 60.29 | *** | MCGRATH, AK | 23.96 | 156.7 |
| HUNTINGTON, WV | 60.00 | 147.2 | GREAT FALLS, MT | 22.68 | 151.1 |
| ISLIP, NY | 58.38 | 130.4 | KALISPELL, MT | 22.20 | 141.5 |
| CHARLESTON, WV | 57.98 | 137.4 | NOME, AK | 20.63 | 141.9 |
| NORFOLK/CHAMBERS NAS, VA | 57.51 | 128.0 | | | |

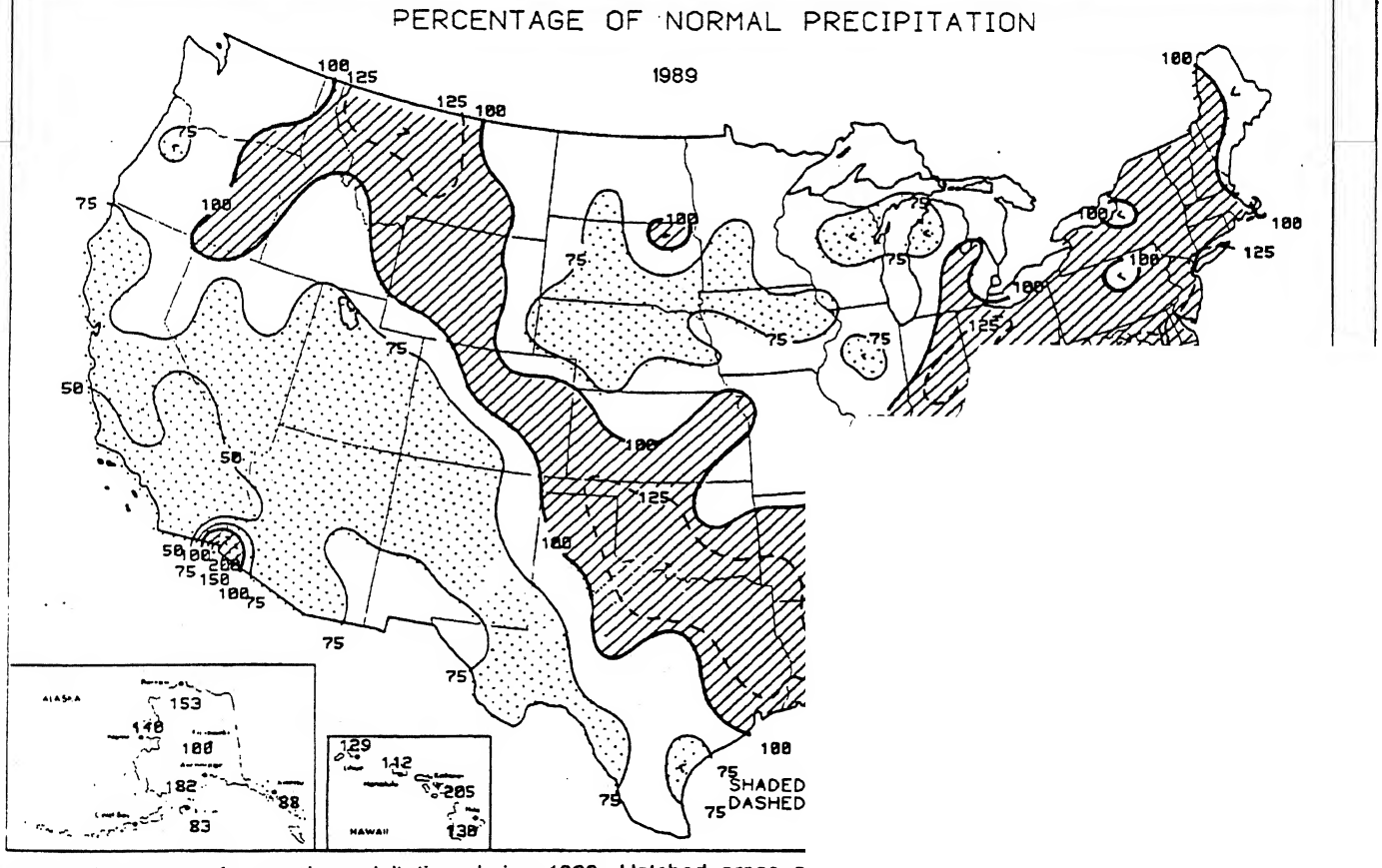
*(Note: Stations without precipitation normals are indicated by asterisks.)*




Annual precipitation percentiles for 1989. While most of the East, South, south-central Great Plains, and northern Rockies experienced significant wetness (>70%ile) during 1989, substantial dryness (<30%ile) afflicted the Pacific Coast states, the extreme southern Plains, and much of the northern Great Plains and the upper and middle Mississippi Valley. This marked the third consecutive year with subnormal yearly precipitation in both the East-North Central (MN, IA, WI, MI) and West (CA, NV) regions.

## TABLE 2. SELECTED STATIONS WITH LESS THAN 75% OF NORMAL PRECIPITATION AND NORMAL PRECIPITATION 18.00 INCHES OR MORE DURING 1989.

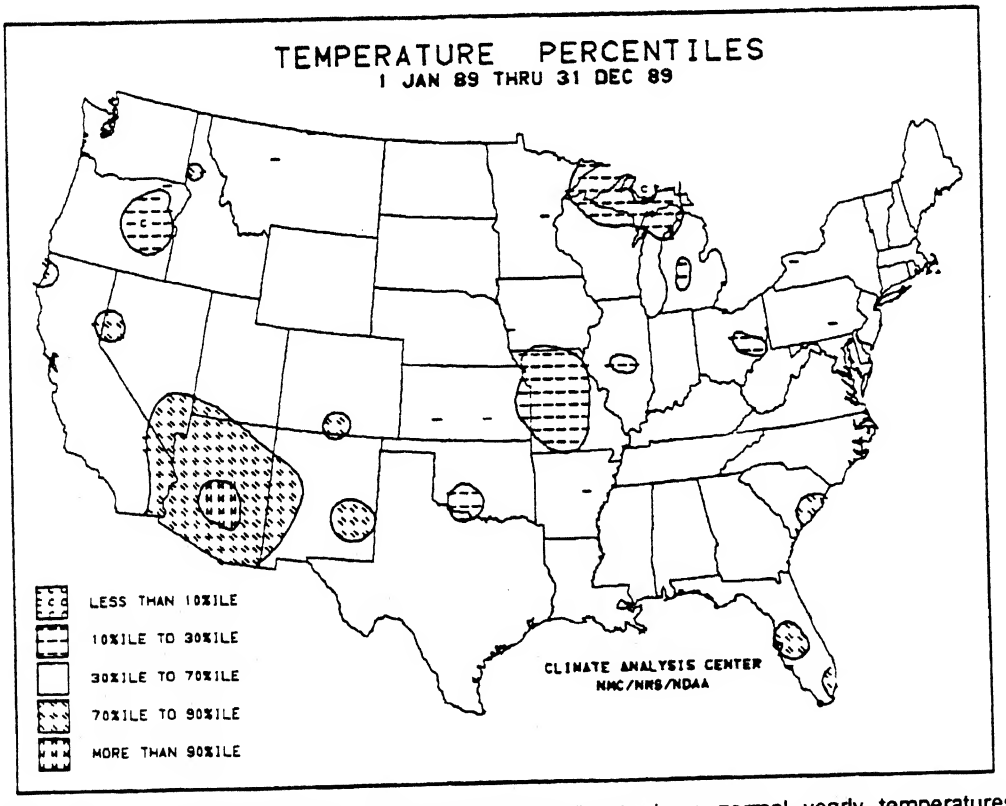
| STATION | TOTAL (INCHES) | PCT. OF NORMAL | NORMAL (INCHES) | STATION | TOTAL (INCHES) | PCT. OF NORMAL | NORMAL (INCHES) |
|---|---|---|---|---|---|---|---|
| MCALLEN, TX | 9.05 | 39.3 | 23.04 | DUBUQUE, IA | 22.00 | 57.0 | 38.61 |
| BEEVILLE NAS, TX | 9.49 | 31.9 | 29.75 | PARK FALLS, WI | 22.01 | 67.0 | 32.85 |
| PRESCOTT, AZ | 9.72 | 51.6 | 18.84 | PELLSTON, MI | 22.06 | 67.2 | 32.84 |
| SAN FRANCISCO, CA | 11.37 | 58.2 | 19.54 | NORTH OMAHA, NE | 22.33 | 74.0 | 30.17 |
| GRAND FORKS, ND | 11.67 | 63.8 | 18.29 | PEORIA, IL | 22.55 | 64.6 | 34.91 |
| SIDNEY, NE | 12.43 | 67.9 | 18.30 | WAUSAU, WI | 22.56 | 71.4 | 31.62 |
| ALICE, TX | 13.20 | 46.3 | 28.52 | CEDAR RAPIDS, IA | 22.98 | 64.5 | 35.62 |
| NORTH PLATTE, NE | 14.05 | 73.0 | 19.24 | BURLINGTON, IA | 23.70 | 68.5 | 34.61 |
| FLAGSTAFF, AZ | 14.56 | 69.8 | 20.85 | PALACIOS, TX | 25.21 | 57.8 | 43.61 |
| WATERTOWN, SD | 15.69 | 70.3 | 22.33 | EUREKA, CA | 25.51 | 66.6 | 38.31 |
| SIOUX FALLS, SD | 15.74 | 65.9 | 23.90 | VICTORIA, TX | 25.81 | 69.9 | 36.90 |
| MASON CITY, IA | 16.32 | 53.0 | 30.81 | ROCKFORD, IL | 26.21 | 71.7 | 36.55 |
| NORFOLK, NE | 16.57 | 70.3 | 23.57 | SALEM, OR | 27.83 | 69.4 | 40.11 |
| HOMER, AK | 16.82 | 70.5 | 23.85 | REDDING, CA | 29.58 | 72.2 | 40.95 |
| QUINCY, IL | 18.28 | 48.6 | 37.65 | WEST PLAINS, MO | 32.23 | 74.5 | 43.27 |
| TRAVERSE CITY, MI | 18.74 | 63.1 | 29.71 | VERO BEACH, FL | 35.61 | 69.3 | 51.41 |
| CORPUS CHRISTI, TX | 18.86 | 60.9 | 30.98 | GAINESVILLE, FL | 37.63 | 74.9 | 50.22 |
| ESCENABA, MI | 19.14 | 66.8 | 28.67 | WEST PALM BEACH, FL | 38.62 | 64.9 | 59.51 |
| ST. CLOUD, MN | 19.55 | 71.6 | 27.29 | MIAMI, FL | 42.63 | 74.2 | 57.48 |
| WATERLOO, IA | 19.61 | 59.8 | 32.79 | ADAK, AK | 43.22 | 68.0 | 63.56 |
| AUSTIN/BERGSTROM, TX | 20.05 | 63.8 | 31.41 | KETCHIKAN, AK | 58.87 | 36.9 | 159.33 |
| HOUGHTON LAKE, MI | 20.22 | 72.2 | 27.99 | SITKA, AK | 59.94 | 63.4 | 94.54 |
| GREEN BAY, WI | 20.41 | 73.5 | 27.76 | ANNETTE ISLAND, AK | 85.96 | 74.6 | 115.24 |




Annual percent of normal precipitation during 1989. Hatched areas a than 75%. Surplus yearly precipitation fell on a narrow swath from lower Mississippi Valley and throughout the eastern third of the coun much of Florida. In sharp contrast, under 75% of the normal an southwestern quarter of the U.S. and in the north-central U.S. Par half the usual yearly rainfall as the normally rainy months of Novel

## TABLE 3. 1989 AVERAGE TEMPERATURES 1.5°F OR MORE ABOVE NORMAL.

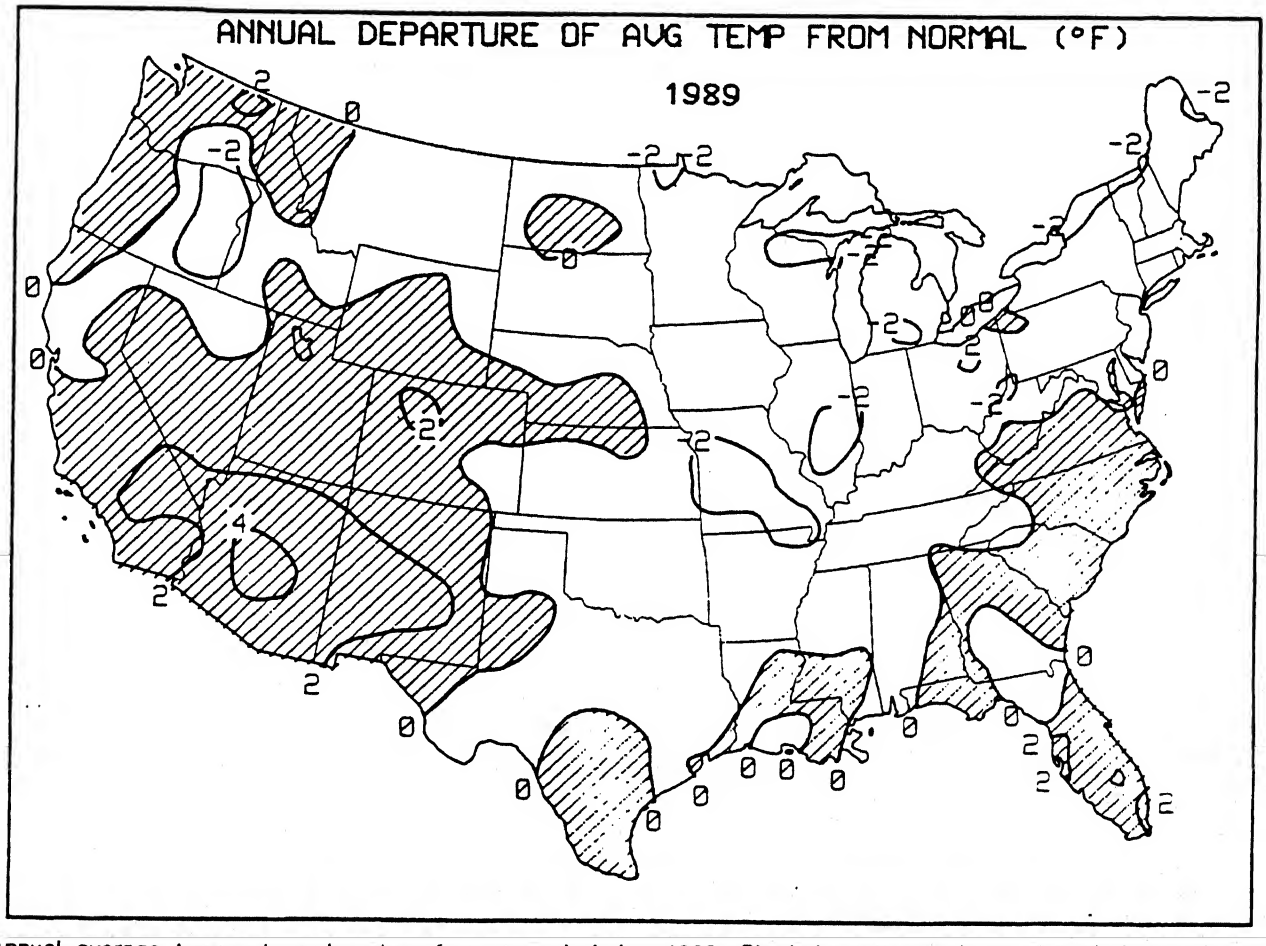
| STATION | DEPARTURE (°F) | AVERAGE (°F) |
|---|---|---|
| PHOENIX, AZ | +5.7 | 77.0 |
| MCGRATH, AK | +5.2 | 30.6 |
| GLENDALE/LUKE AFB, AZ | +4.5 | 74.3 |
| PRESCOTT, AZ | +4.3 | 57.4 |
| BARROW, AK | +4.0 | 13.3 |
| OMAK, WA | +3.7 | 51.2 |
| KOTZEBUE, AK | +3.5 | 24.9 |
| TUCSON, AZ | +3.4 | 71.4 |
| TUCSON/DAVIS-MONTHAN AFB, AZ | +3.2 | 70.6 |
| ANIAK, AK | +3.0 | 31.1 |
| SITKA, AK | +2.9 | 45.5 |
| TRUTH OR CONSEQUENCES, NM | +2.8 | 62.7 |
| VALDEZ, AK | +2.7 | 38.8 |
| YUMA, AZ | +2.6 | 76.6 |
| DOUGLAS, AZ | +2.6 | 64.3 |
| ST. PAUL ISLAND, AK | +2.6 | 37.1 |
| LAS VEGAS, NV | +2.4 | 68.8 |
| ROSWELL, NM | +2.4 | 62.4 |
| FLAGSTAFF, AZ | +2.4 | 47.9 |
| JUNEAU, AK | +2.3 | 42.4 |
| BEEVILLE NAS, TX | +2.2 | 73.0 |
| RENO, NV | +2.1 | 51.6 |
| SAN BERNARDINO/NORTON AFB, CA | +2.0 | 65.3 |
| EAGLE, CO | +2.0 | 44.4 |
| KING SALMON, AK | +2.0 | 35.0 |
| CHARLESTON, SC | +1.9 | 66.8 |
| NORTHWAY, AK | +1.9 | 23.7 |
| MIAMI, FL | +1.8 | 77.5 |
| MCALLEN, TX | +1.7 | 75.1 |
| LEWISTON, ID | +1.7 | 53.9 |
| TAMPA, FL | +1.6 | 73.7 |
| EUREKA, CA | +1.6 | 53.7 |
| ANNETTE ISLAND, AK | +1.6 | 47.1 |
| DEMING, NM | +1.5 | 61.9 |
| ALBUQUERQUE, NM | +1.5 | 58.1 |
| BURLEY, ID | +1.5 | 49.3 |
| FAIRBANKS, AK | +1.5 | 27.7 |



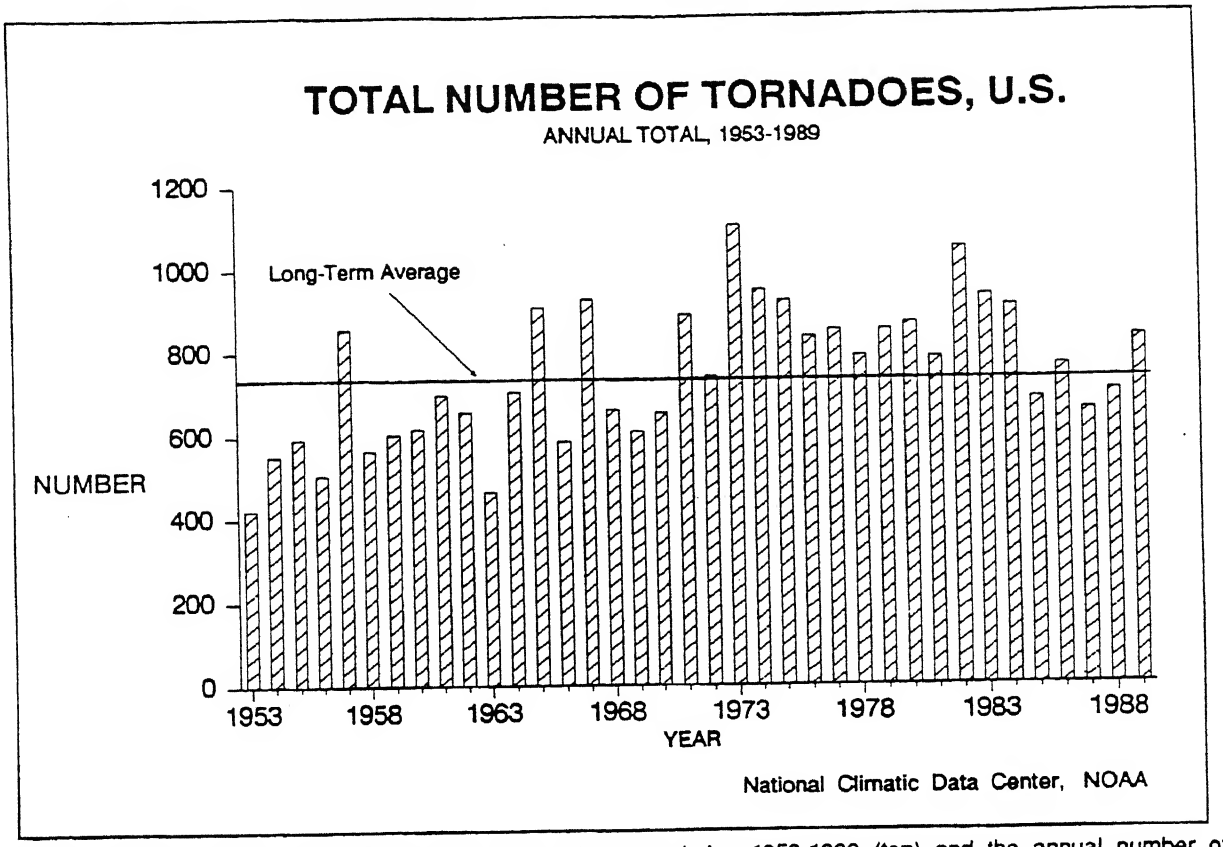

Annual temperature percentiles for 1989. Climatologically significant above normal yearly temperatures (>70%ile) were limited to the Southwest and a few isolated areas along the southern Atlantic Coast. Similarly, substantial subnormal Jan.-Dec. temperatures were confined to portions of the upper Great Lakes, the Ohio Valley, the lower Missouri Valley, and the northern Intermountain West. On a national basis, 1989's yearly temperatures averaged slightly below the long-term mean, ranking as the 36th coldest during the past 95 years.

## TABLE 4. 1989 AVERAGE TEMPERATURES 1.5°F OR MORE BELOW NORMAL.

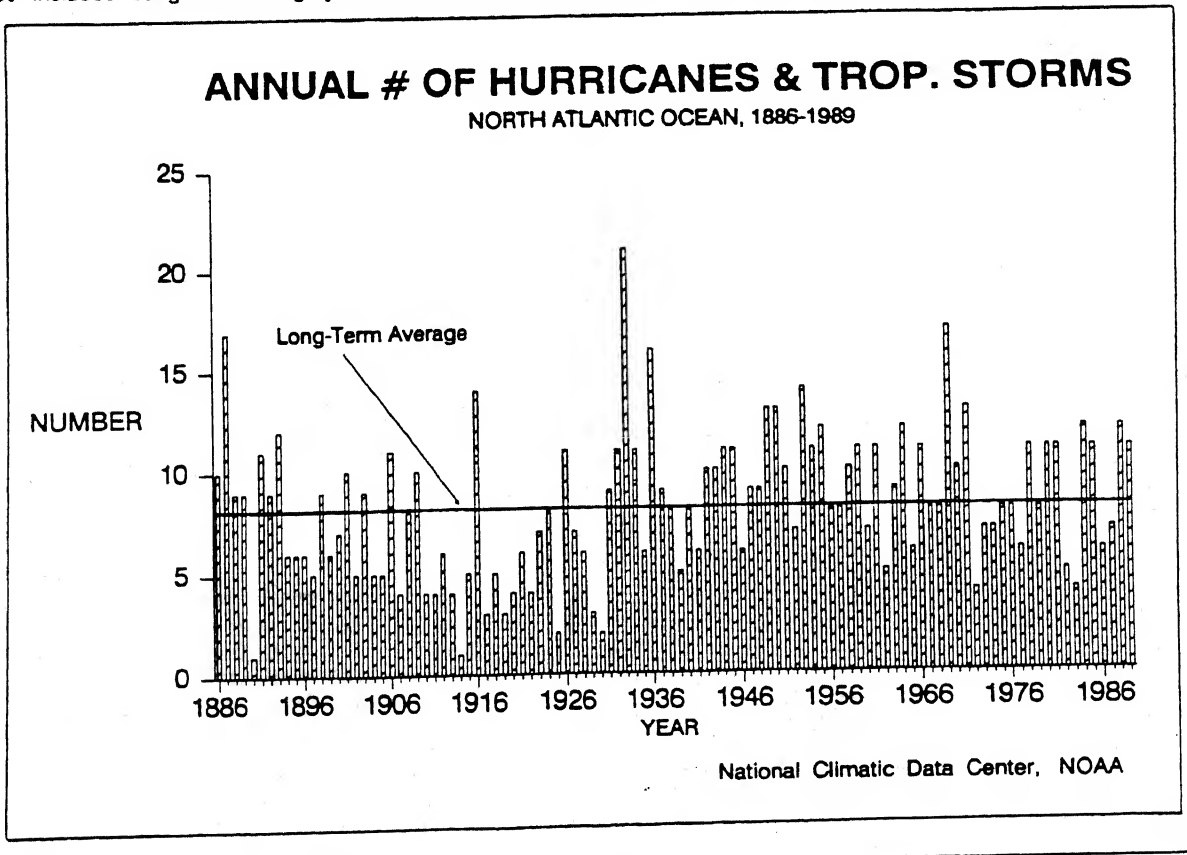
| STATION | DEPARTURE (°F) | AVERAGE (°F) | STATION | DEPARTURE (°F) | AVERAGE (°F) |
|---|---|---|---|---|---|
| BURNS, OR | -3.1 | 43.6 | MASSENA, NY | -1.7 | 41.8 |
| DECATUR, IL | -3.1 | 50.2 | MEACHAM, OR | -1.7 | 42.0 |
| WARROAD, MN | -3.0 | 34.4 | MANSFIELD, OH | -1.7 | 47.9 |
| KANSAS CITY/INTL., MO | -2.7 | 52.9 | SPRINGFIELD, IL | -1.7 | 50.9 |
| HOULTON, ME | -2.4 | 37.7 | SPRINGFIELD, MO | -1.7 | 54.1 |
| COLUMBIA, MO | -2.3 | 52.6 | JOPLIN, MO | -1.7 | 56.0 |
| BLYTHEVILLE AFB, AR | -2.0 | 59.3 | WALLA WALLA, WA | -1.6 | 52.4 |
| BAKER, OR | -1.9 | 43.8 | ROLLA, MO | -1.6 | 53.9 |
| PARKERSBURG/WOOD CO., WV | -1.9 | 52.4 | BELLEVILLE/SCOTT AFB, IL | -1.6 | 54.5 |
| JONESBORO, AR | -1.9 | 59.3 | CHANUTE, KS | -1.6 | 54.9 |
| PARK FALLS, WI | -1.8 | 38.8 | HARRISON, AR | -1.6 | 56.5 |
| GRAND RAPIDS, MI | -1.8 | 46.1 | AUGUSTA, ME | -1.5 | 43.7 |
| JACKSON, MI | -1.8 | 46.2 | SAGINAW, MI | -1.5 | 45.4 |
| KANSAS CITY/MUNI., MO | -1.8 | 54.6 | WICHITA FALLS, TX | -1.5 | 62.1 |
| ESCENABA, MI | -1.7 | 40.4 | REDDING, CA | -1.5 | 62.4 |




Annual average temperature departure from normal during 1989. Shaded area are above normal. Most of the Pacific Northwest, the Southwest, and portions of the Gulf and southern Atlantic Coasts experienced above normal yearly temperatures while cooler than normal Jan.-Dec. conditions were observed across much of the Plains, the Mississippi, Ohio, and Tennessee Valleys, the Great Lakes, and the Northeast, the latter region greatly influenced by the coldest December on record.

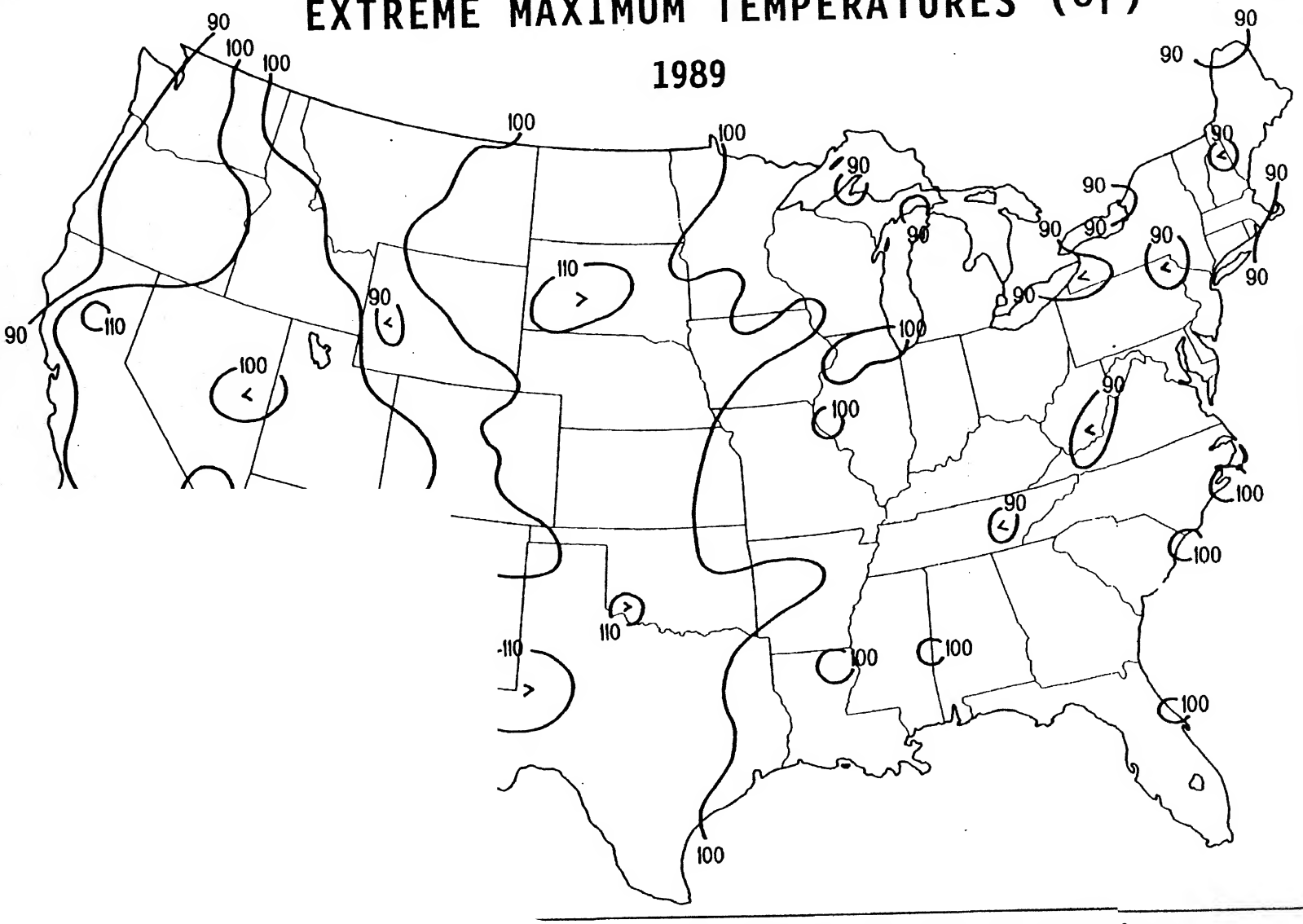



The total annual number of tornadoes in the lower 48 states during 1953-1989 (top) and the annual number of hurricanes and tropical storms in the North Atlantic Ocean from 1886-1989 (bottom). While 1989 recorded an above normal number of tornadoes from the long-term mean (831 vs. mean=748), it was considerably less than the high numbers counted in the early 1970's and early 1980's. Eleven hurricanes and tropical storms formed in the North Atlantic Ocean during 1989, above the long-term yearly average of 8. The last two years have also included dangerous category 5 hurricanes, namely Gilbert (1988) and Hugo (1989).

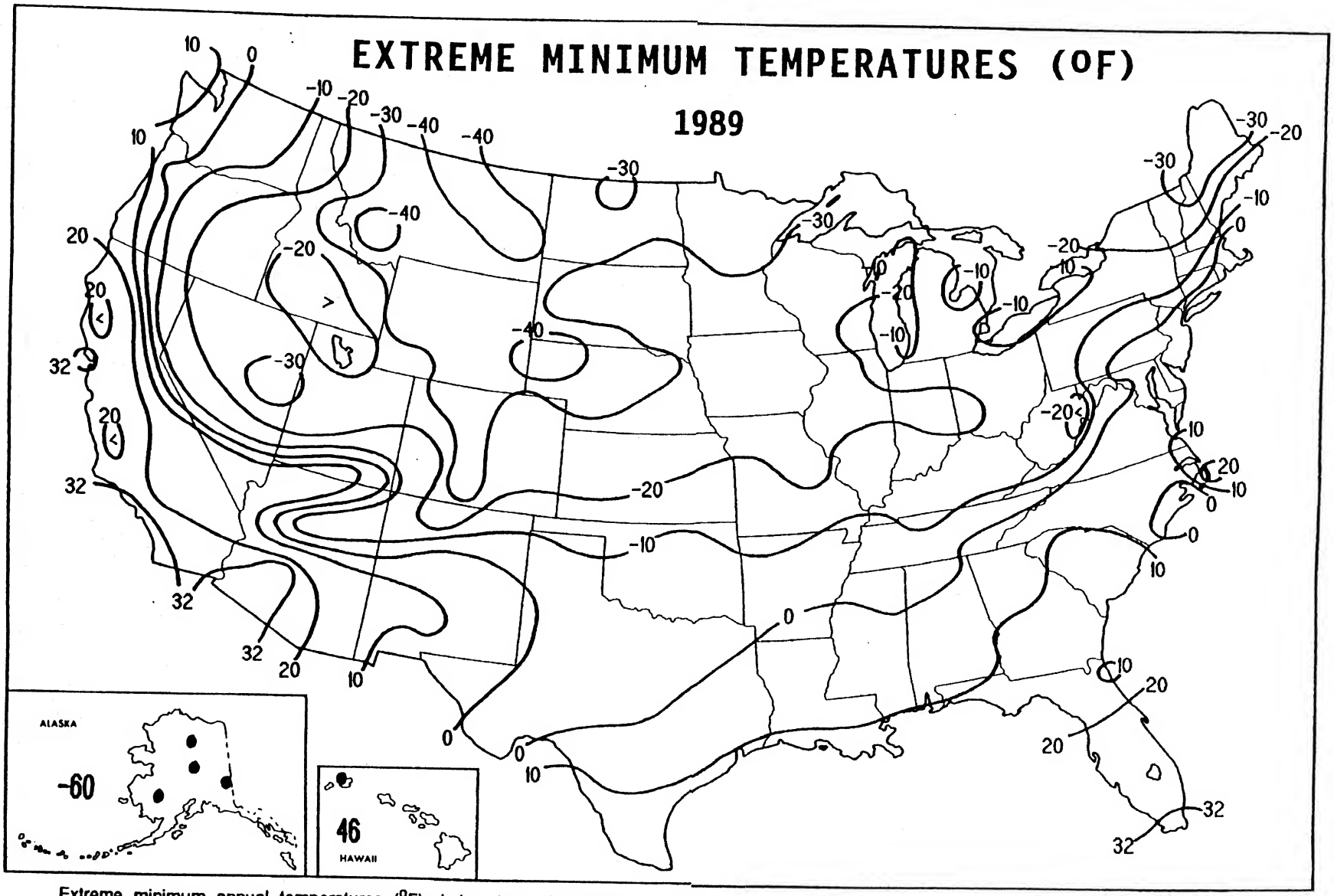


# EXTREME MAXIMUM TEMPERATURES (OF)

## 1989




herms are only analyzed for 90°F, 100°F, 110°F, and 120°F, and are based only etwork. Unlike the hot summer of 1988, when readings in the one hundreds were f the Mississippi River recorded triple-digit highs this year. In southern and central res into the upper eighties and lower nineties (92°F at Nenana on July 8).




Extreme minimum annual temperatures (°F) during 1989. Isotherms are only analyzed for 32°F and for every 10°F starting at -40°F and ending at 20°F. Isotherms are based only on first-order synoptic and airways stations, not the cooperative network. The year's coldest weather occurred during December as lows plunged well below 0°F as far south as central Texas and northern parts of Alabama and Mississippi. Deep snow cover and clear skies also dropped temperatures under 0°F along the North Carolina coast. In the Deep South, December's record cold wave brought lows in the teens and single-digits. In addition, sub-freezing readings were observed throughout the country with the exception of extreme southern Florida, southern Arizona, and along the coast of southern California. Farther north, four stations in Alaska recorded -60°F during late January.